

EVOLUZIONE GEOLOGICA DELLA LAGUNA DI VENEZIA

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“Le lagune altoadriatiche,
tra le Alpi e il Mare, tra Passato e Presente”

LXI Corso nazionale di formazione per insegnanti
22 – 26 aprile 2023 Cavallino Treporti (VE)



Club Alpino Italiano



**Consiglio Nazionale
delle Ricerche**







Prima della
laguna

Formazione
della
laguna

Evoluzione
della
laguna

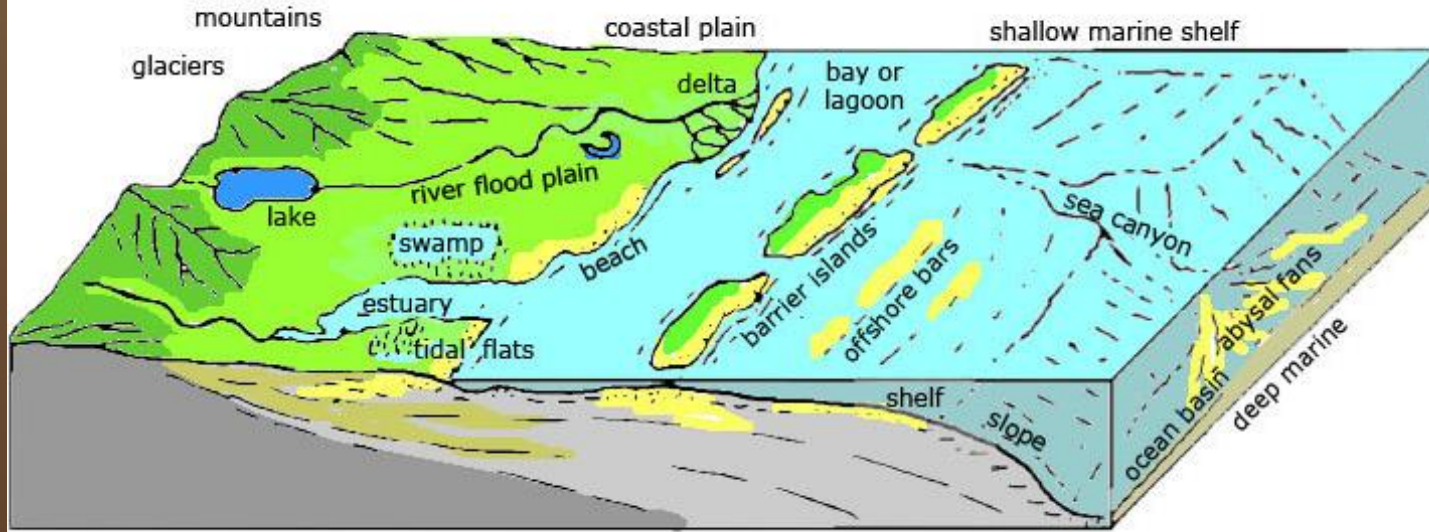
Il racconto
dei
sedimenti
lagunari

I sedimenti:
un archivio
naturale

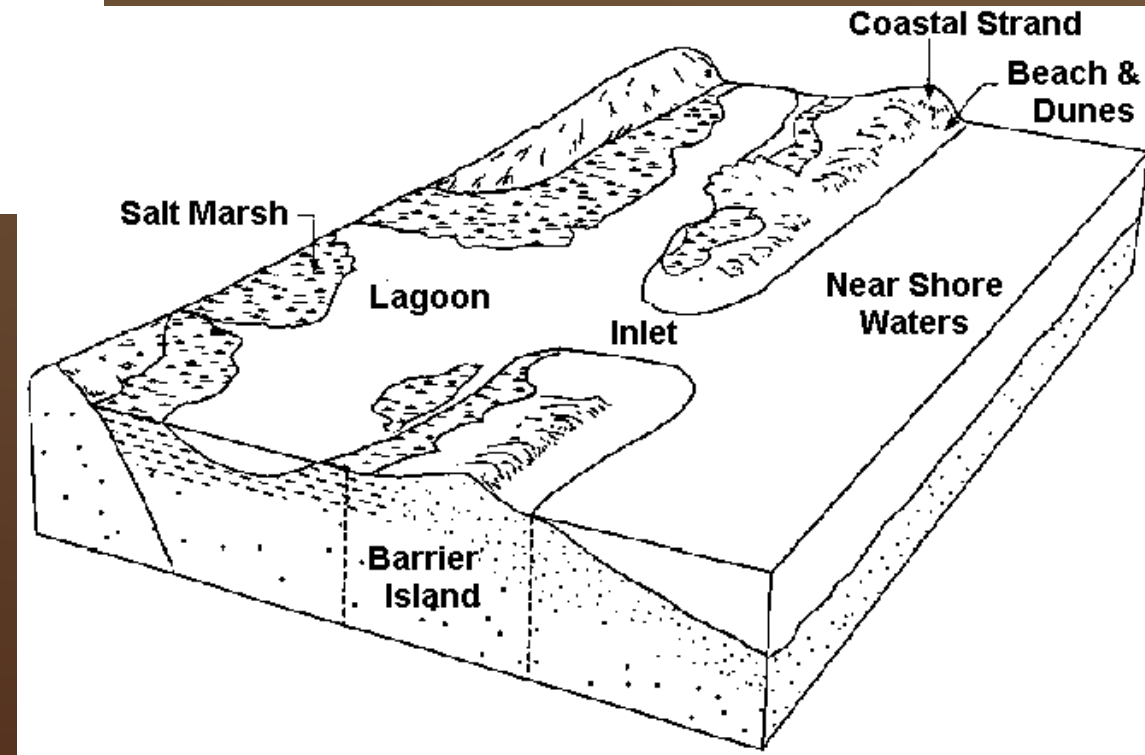


Clastic depositional environments

Humid regions



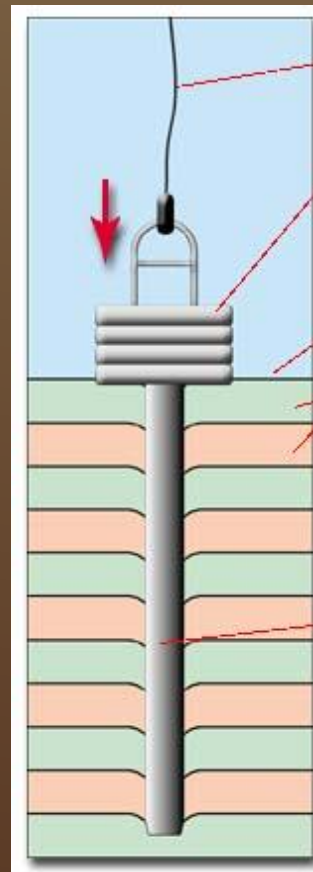
L'AMBIENTE DI DEPOSIZIONE LAGUNARE



Sondaggi geognostici



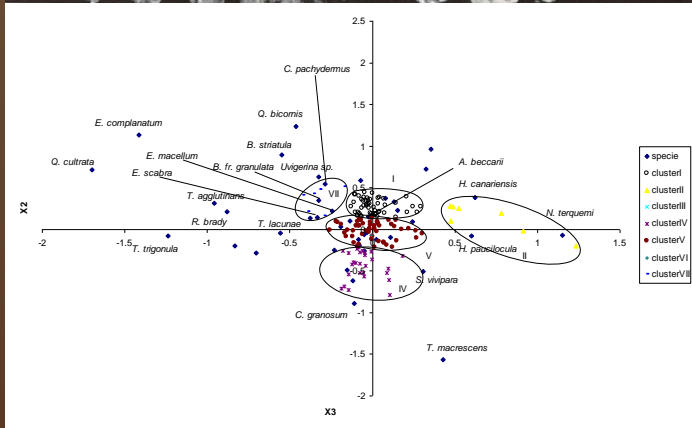
perforazione di pozzi per il campionamento dei sedimenti nel sottosuolo



tramite il carotiere si prelevano campioni cilindrici di sedimento

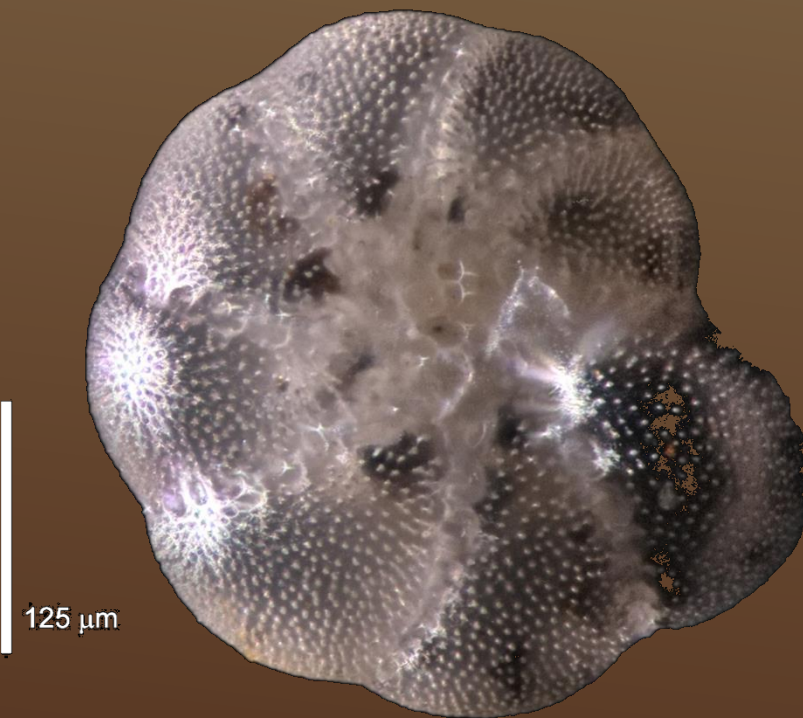


Analisi stratigrafiche



Preparazione del campione
Riconoscimento al microscopio;
Analisi quantitativa
varietà di specie
stretta relazione con variabili ambientali
ricostruzione dei paleoambienti marini e lagunari

Analisi micropaleontologica



I FORAMINIFERI

Sono organismi unicellulari dotati di un guscio

La dimensione media è attorno a 0,5 mm

Sono diffusi in tutti gli ambienti marini, dal Cambriano all'Attuale

I loro gusci si conservano nel sedimento, dove se ne possono accumulare migliaia per centimetro cubico

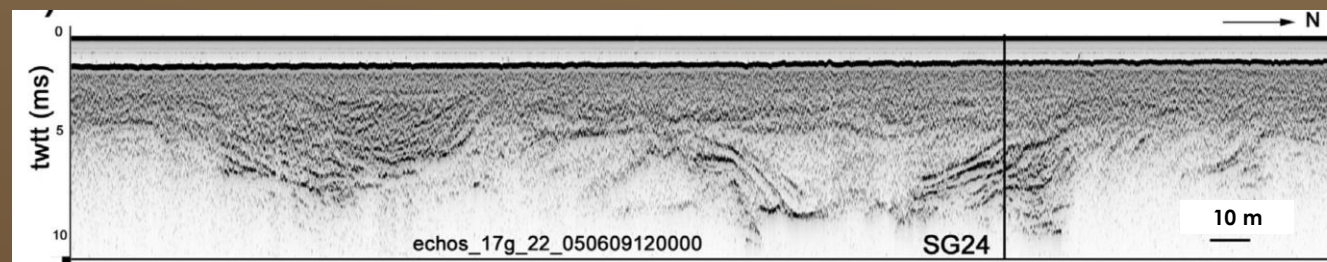
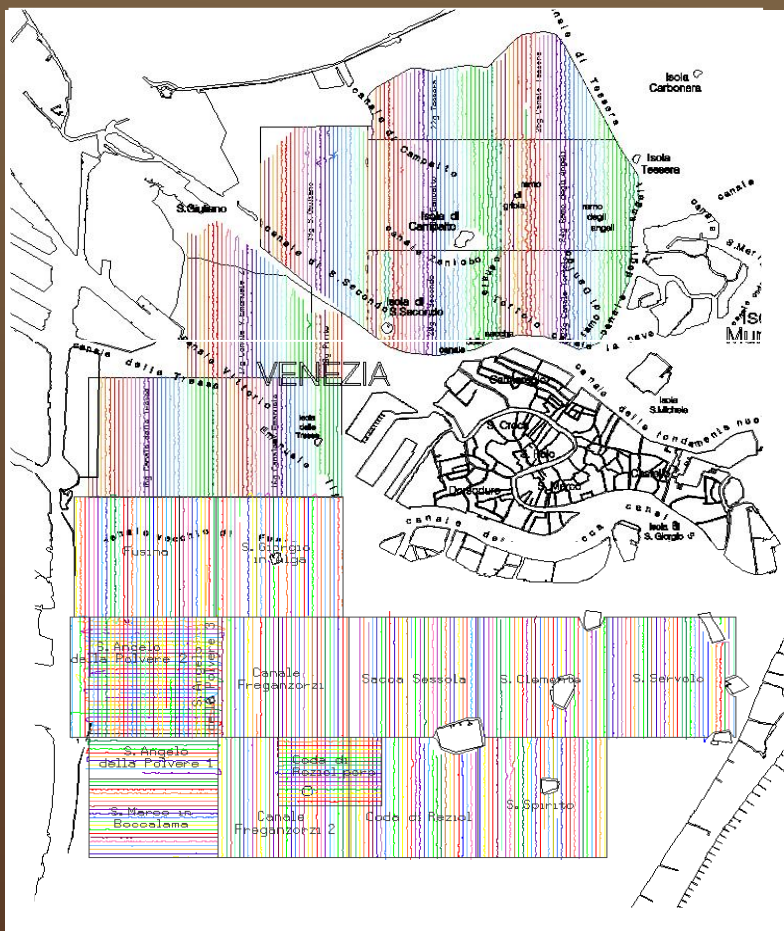
Grande varietà di specie

Stretta relazioni con le variabili ambientali



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Rilievi geofisici

A landscape photograph of a lagoon under a dramatic, cloudy sky. In the foreground, there is a grassy bank with a blue pipe. The middle ground shows the calm water of the lagoon, and the background features a flat, grassy plain under a heavy sky. A large orange circle is superimposed in the center, containing the title text.

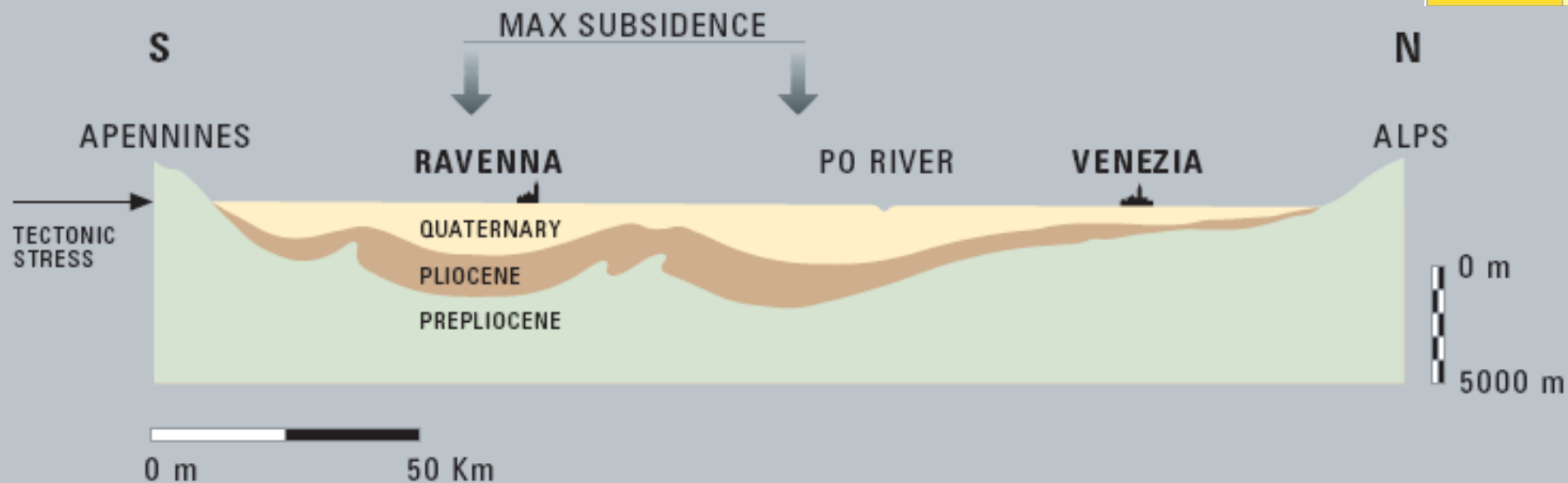
Prima della laguna



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SEZIONE SCHEMATICA DELLA PIANURA PADANA

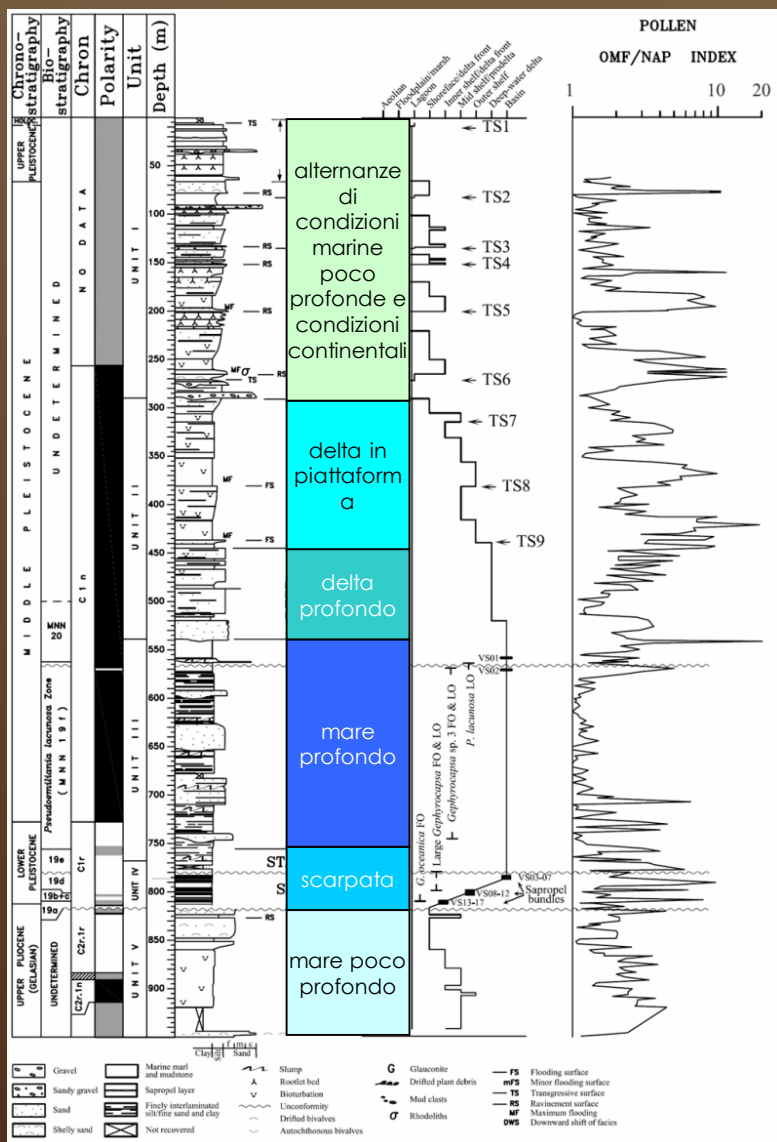


Suddivisione del Periodo Quaternario				
Periodo	Epoca	Età / Piano	Datazione (Ma)	
Quaternario	Olocene	Meghalayano	0	0.0042
		Nordgrippiano	0.0042	0.0082
		Groenlandiano	0.0082	0.0117
	Pleistocene	Tarantiano	0.0117	0.129
		Ioniano	0.129	0.774
		Calabriano	0.774	1.80
		Gelasiano	1.80	2.58
Neogene	Pliocene	Piacenziano	Più antico	

IL POZZO “VENEZIA 1 – CNR”



- ▶ 1971
- ▶ Isola nuova del Tronchetto
- ▶ profondità 947 m

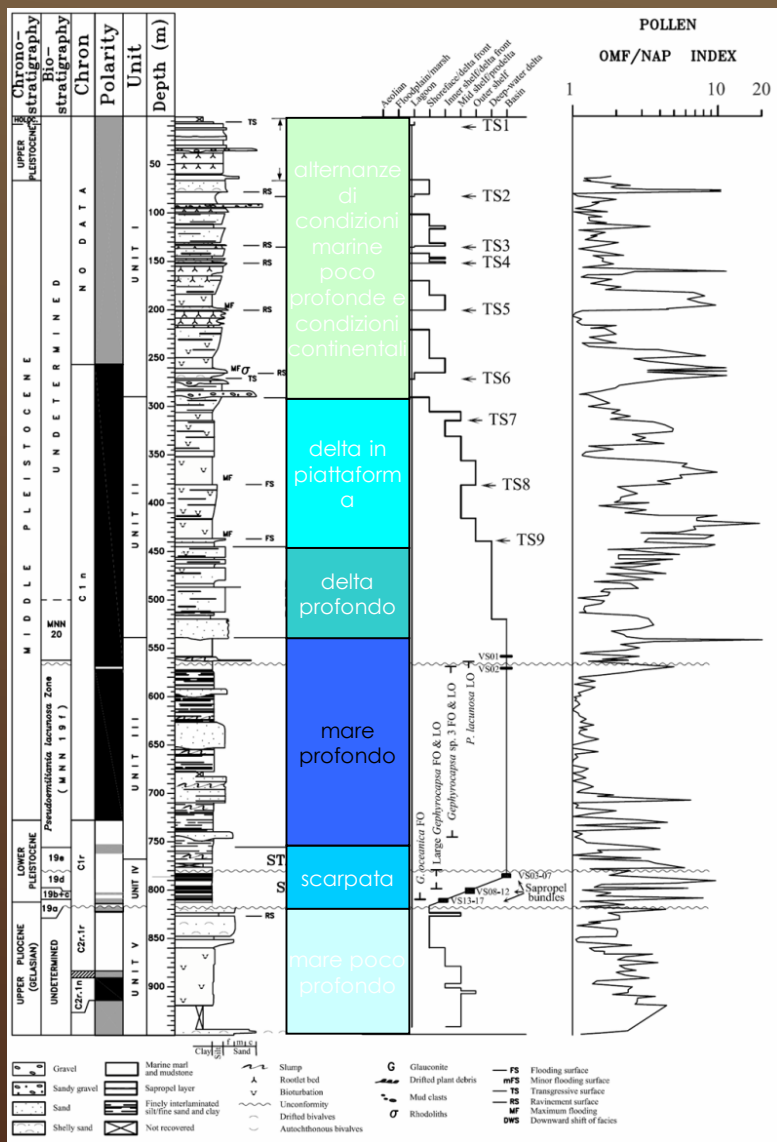


UNITA'	PROFONDITA' ' (m)	ETA' (Ma)
I	0-300	0-0,24
II	300-550	0,24-0,4
III	550-750	0,4-1
IV	750-820	1-1,8
V	820-950	>1,8

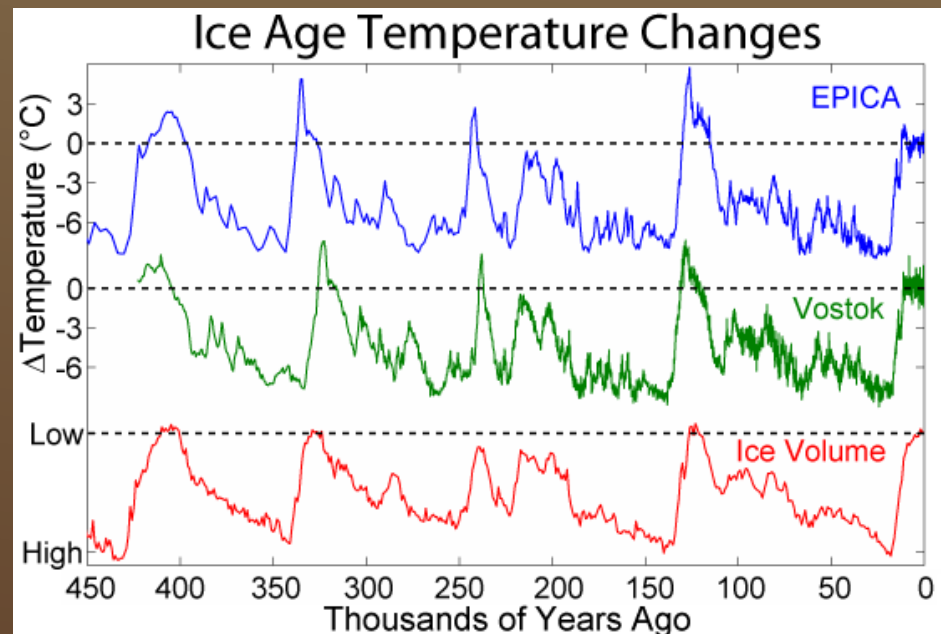


IL POZZO "VENEZIA 1 – CNR"

da Massari et al., 2004

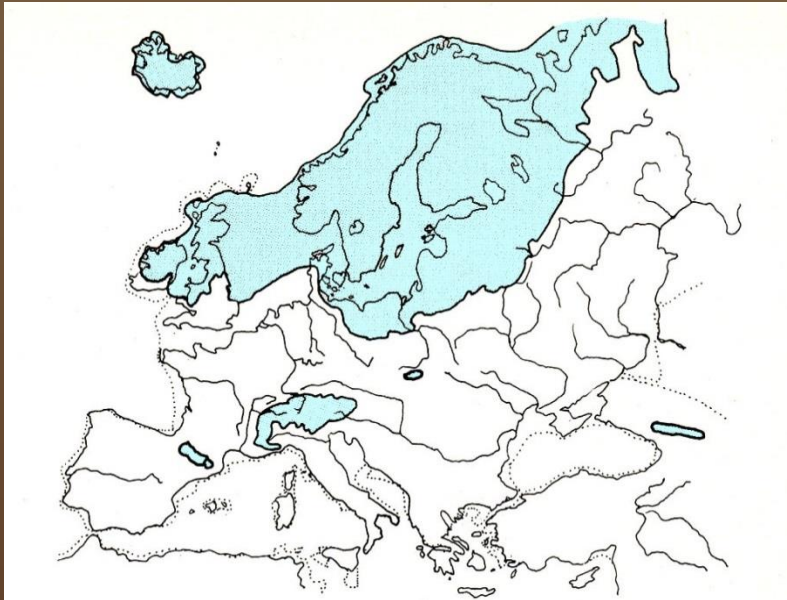




da Massari et al., 2004



IL POZZO “VENEZIA 1 – CNR”

ULTIMO MASSIMO GLACIALE ~20.000 ANNI FA



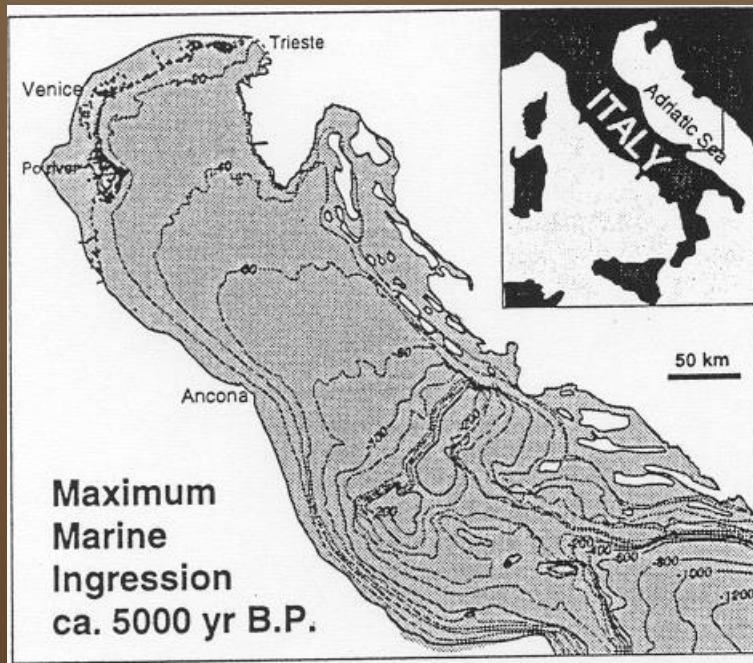
-  Areas submerged during Flandrian transgression
-  Würmian glacial areas

Formazione della laguna

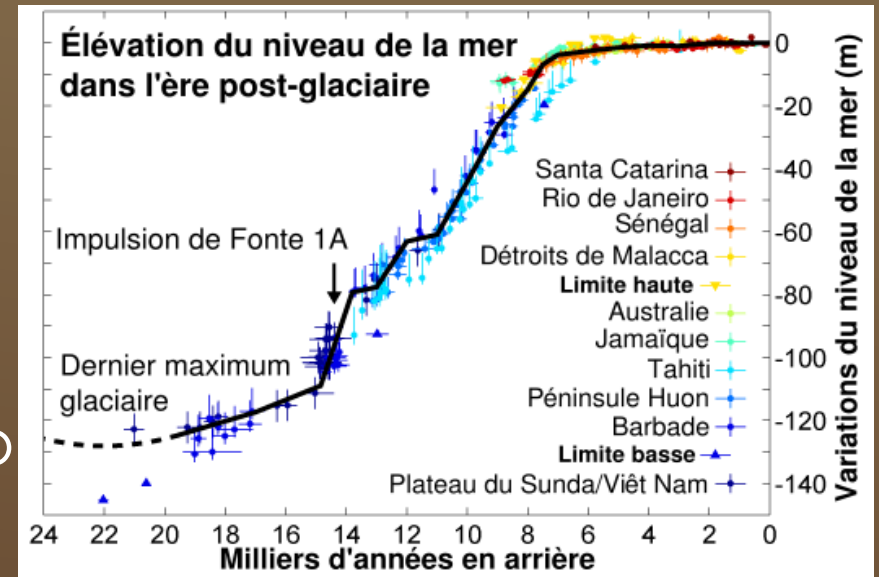


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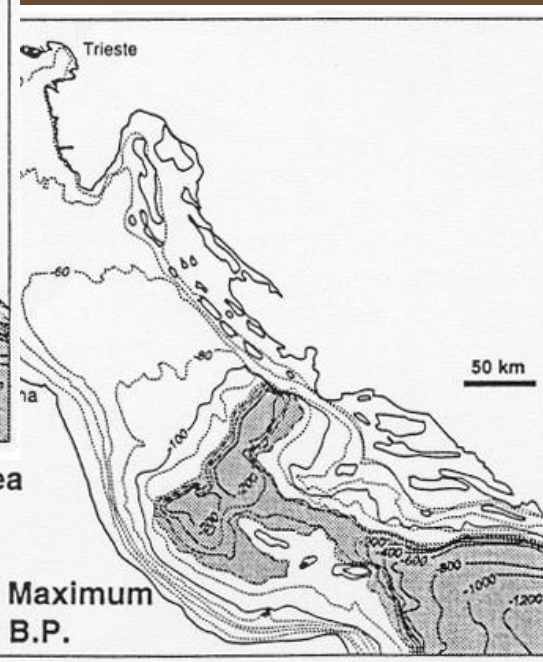
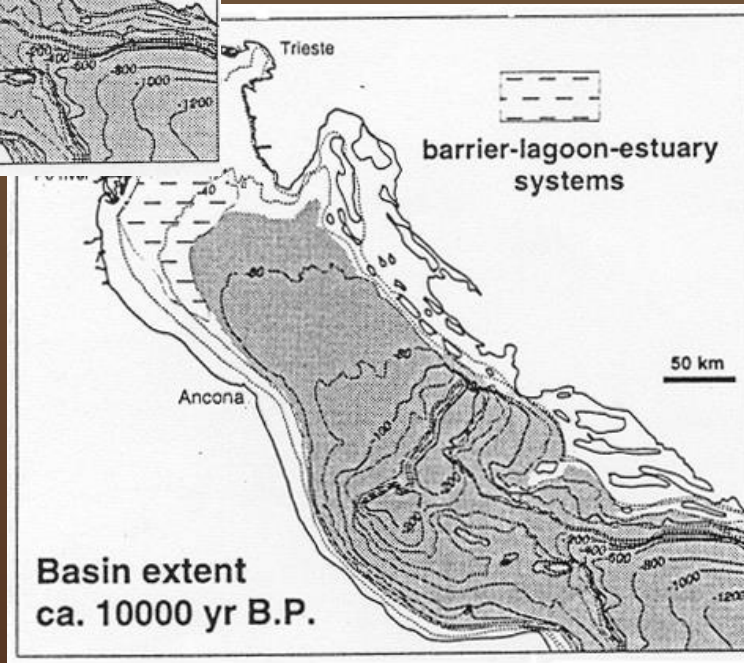




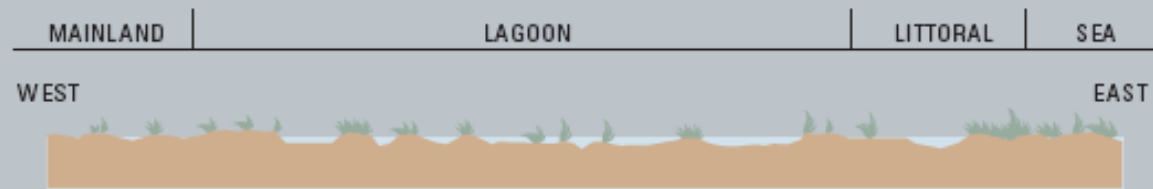
Innalzamento
temperatura
Scioglimento
ghiacciai
Risalita livello marino



Progressivo
allargamento
del Mare
Adriatico
durante il tardo
Quaternario



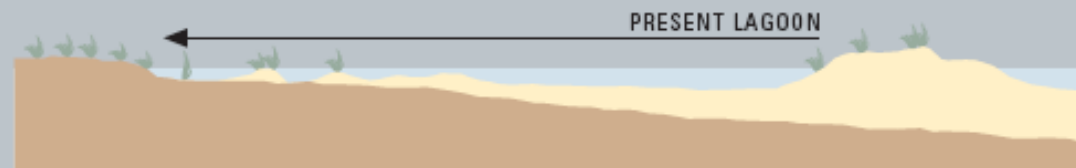
(Correggiari et al., 1996)



10.000 years b.p.: a fluvial-lacustrine environment



6.000 years b.p.: the marine transgression



700 years b.p.: the diversion of rivers:
the basin deepens and extends
to the present shape

Gatto e Carbognin, 1981

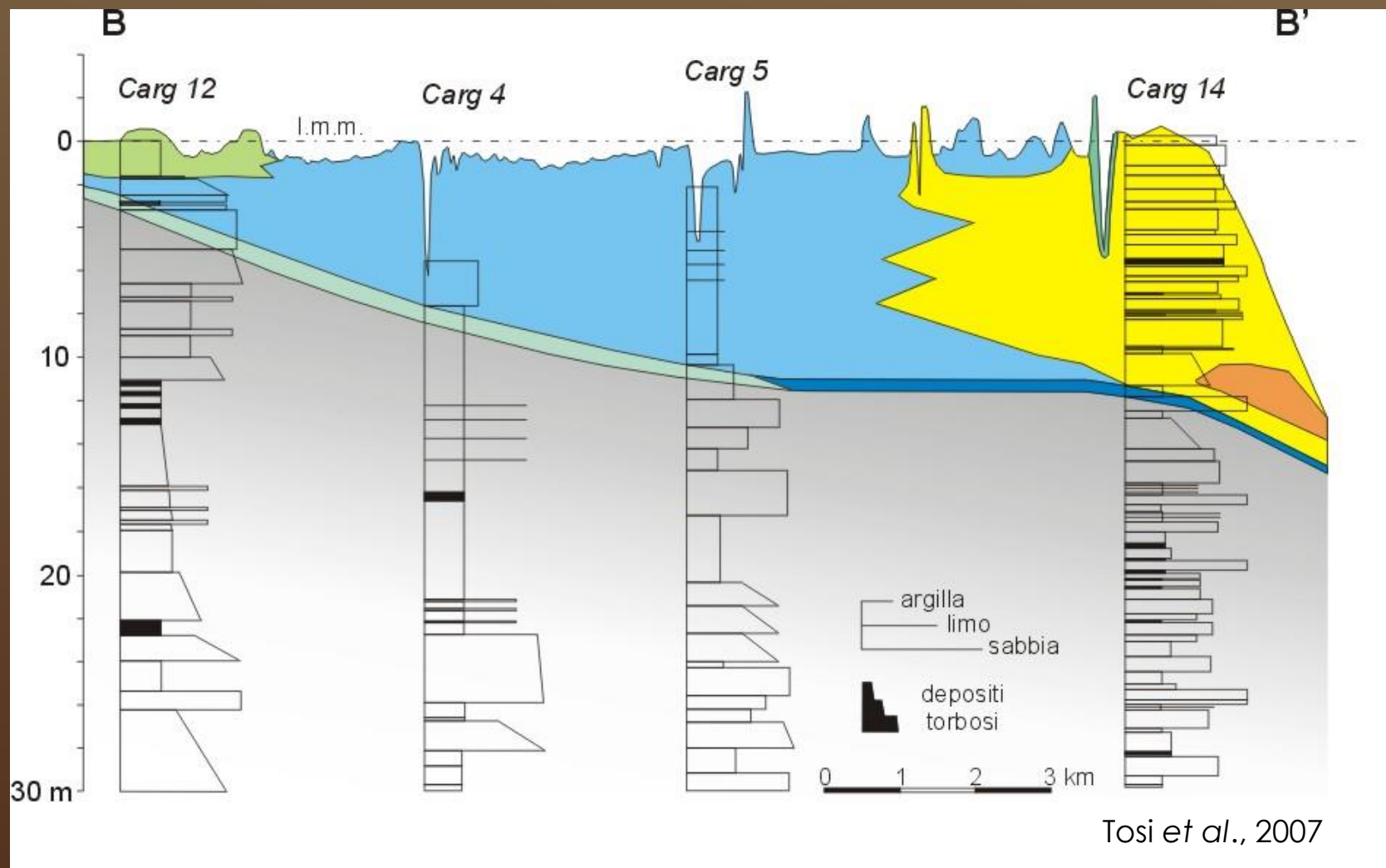
FORMAZIONE DELLA LAGUNA DI VENEZIA



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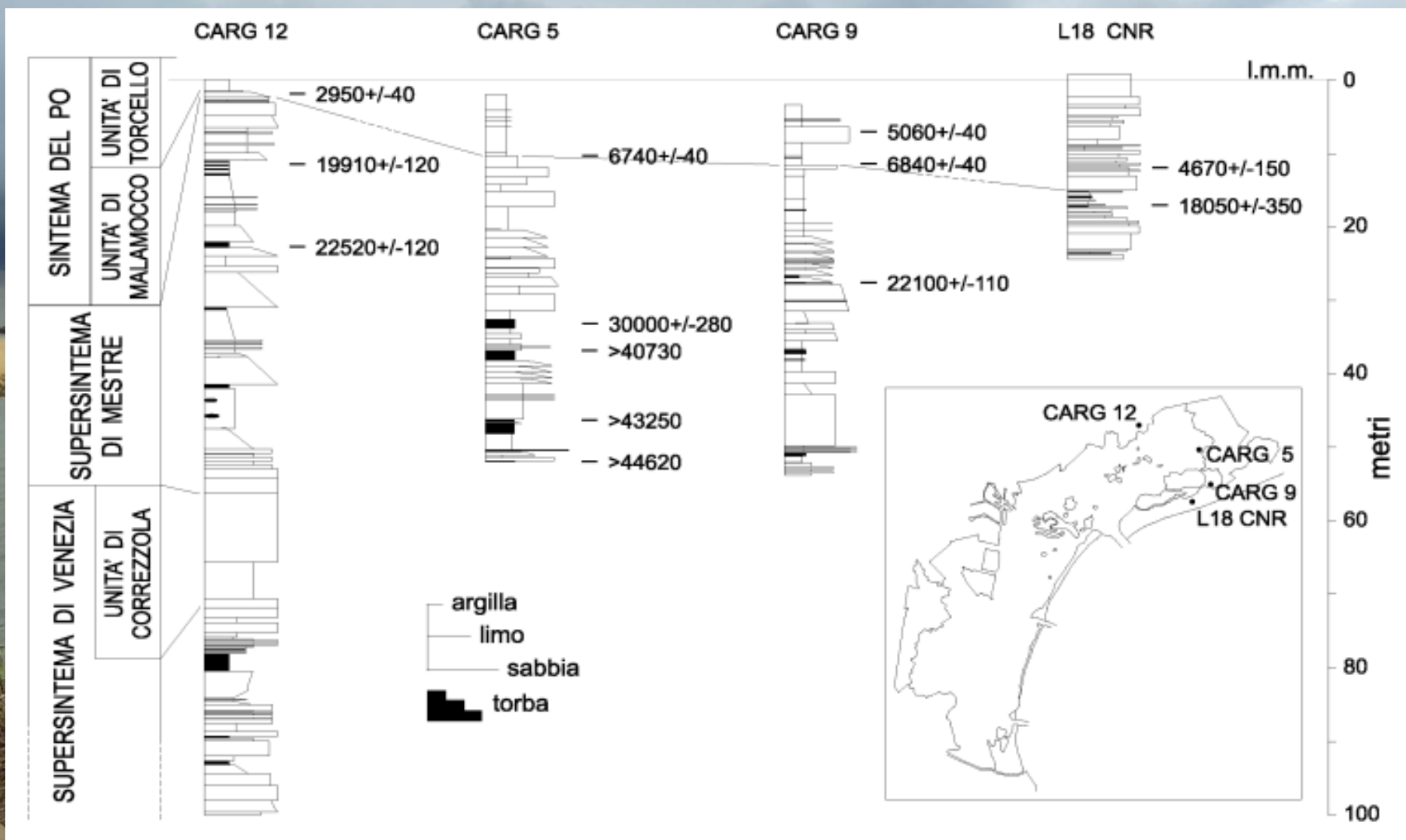


Laguna settentrionale

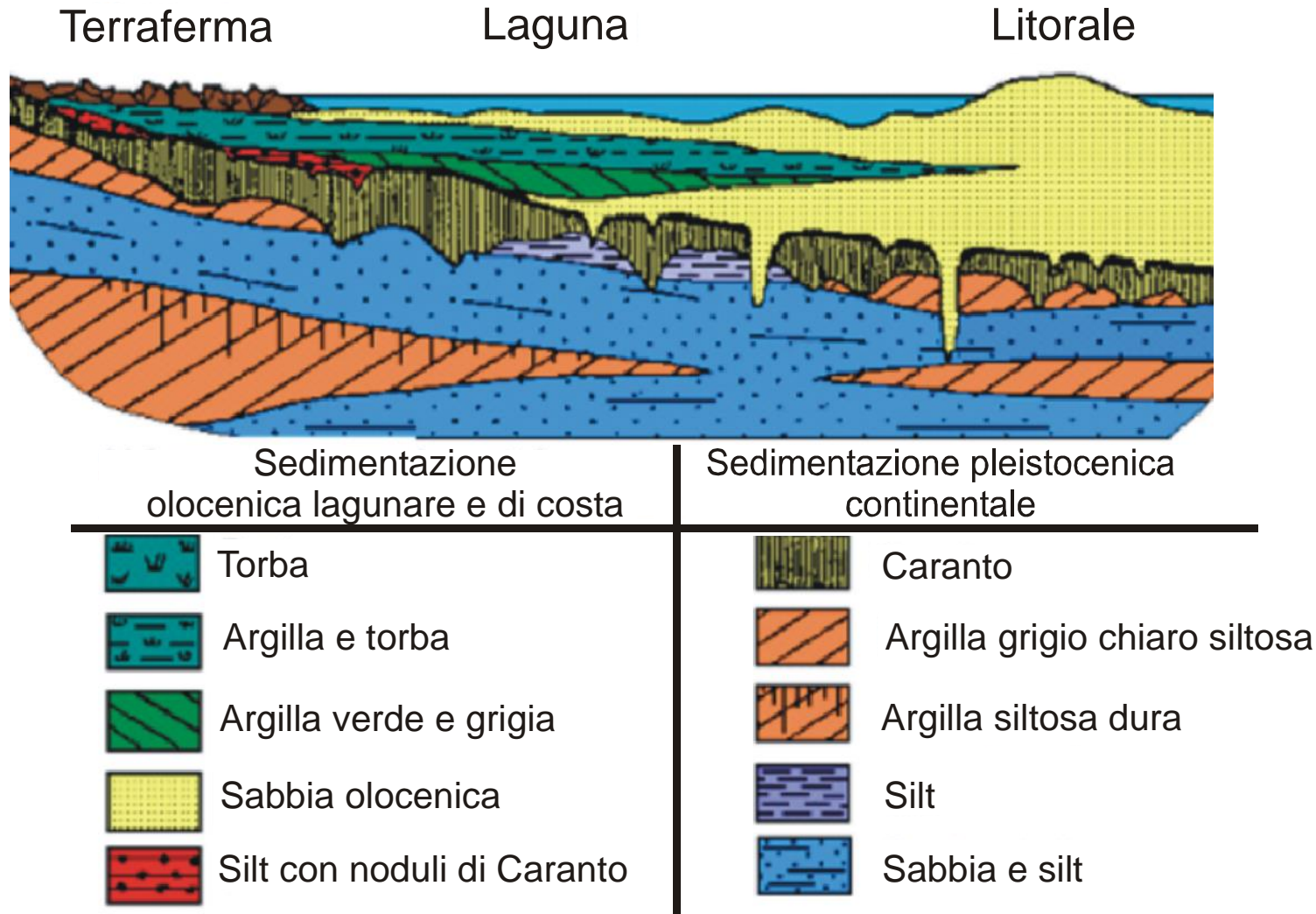


- | | |
|--|---|
| depositi alluvionali | depositi deltizi |
| depositi trasgressivi di retrobarriera | depositi di barriera trasgressiva e di cordone litorale |
| depositi basali di sovralluvionamento | depositi di transizione alla piattaforma |
| depositi lagunari | depositi alluvionali pleistocenici |



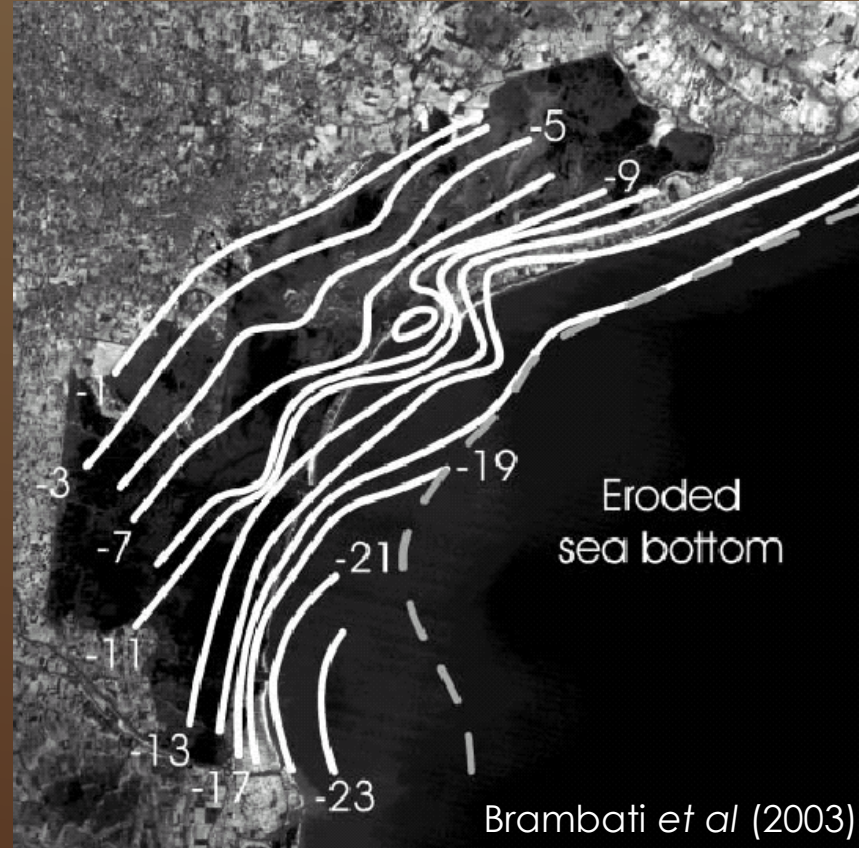
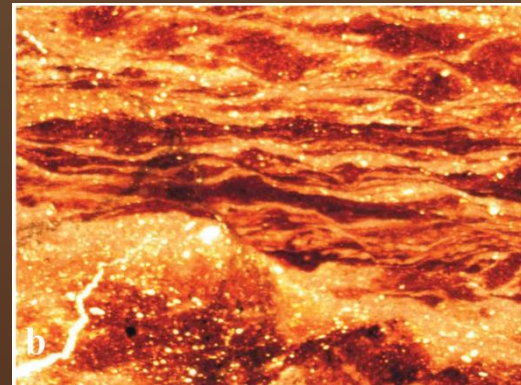
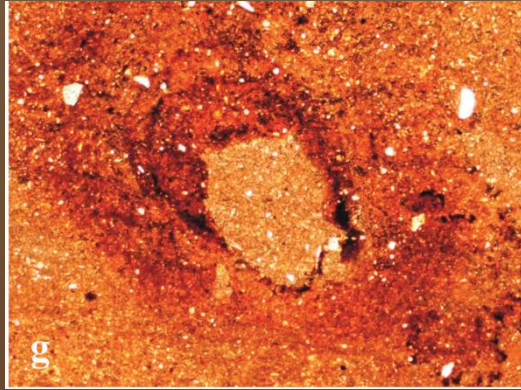


Sequenza stratigrafica tardo-pleistocenica ed olocenica

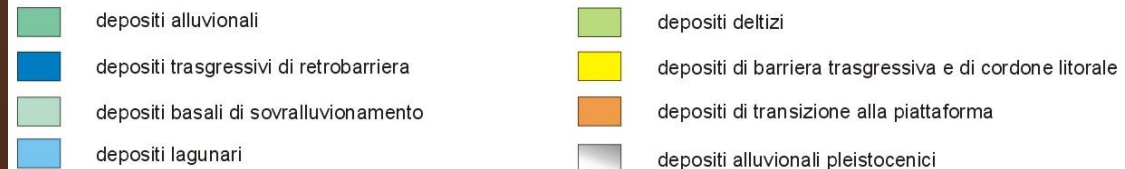
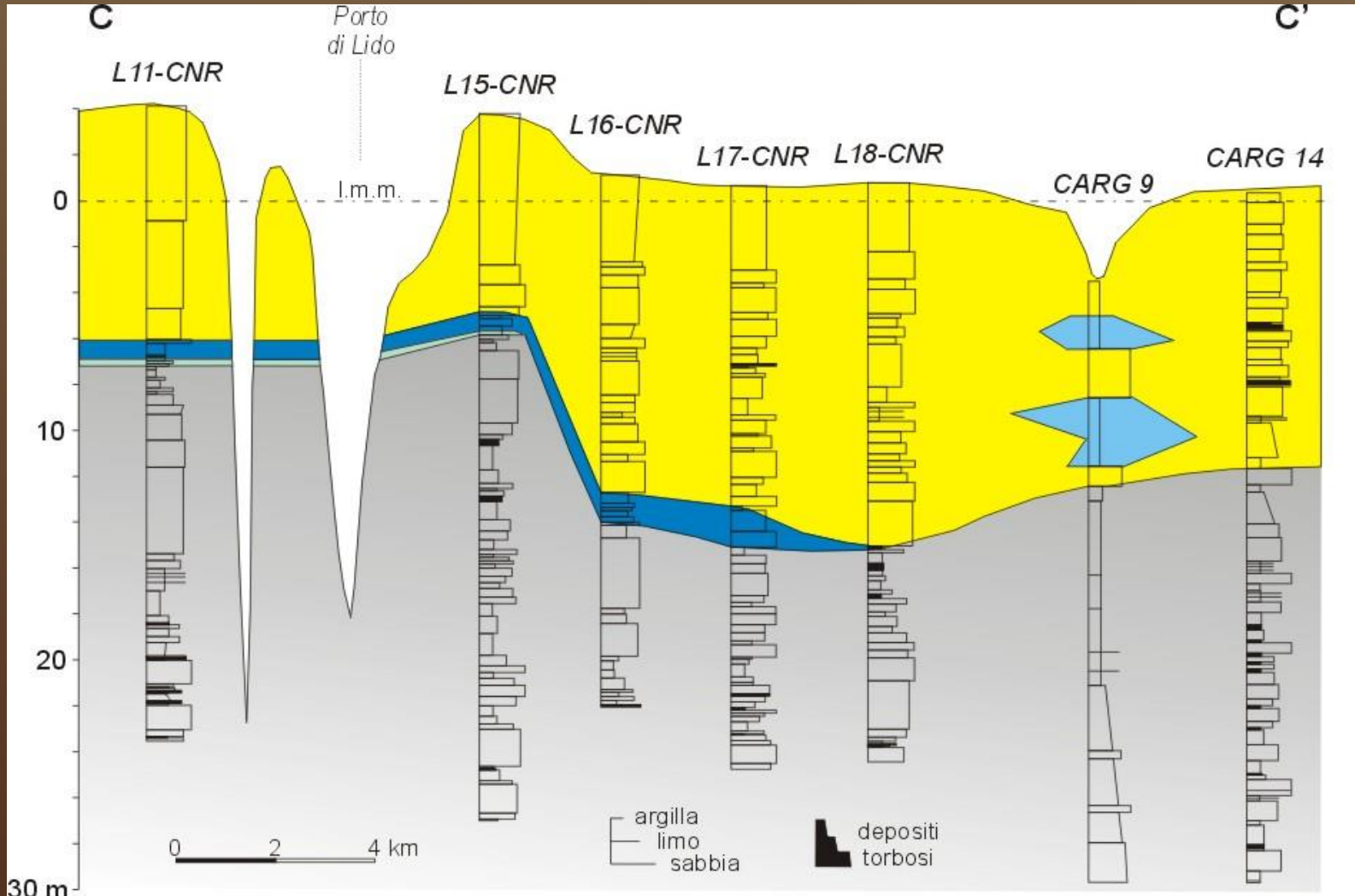


(modificata da Gatto & Previatello, 1974)

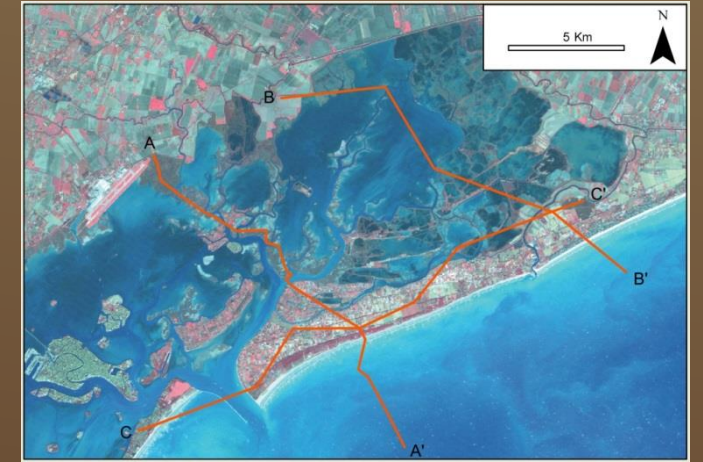
IL LIMITE PLEISTOCENE-OLOCENE E IL CARANTO



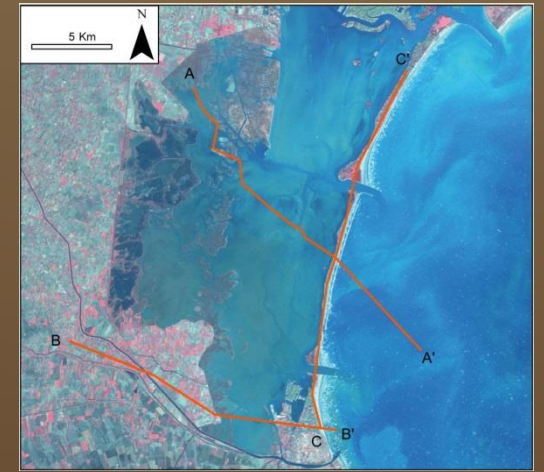
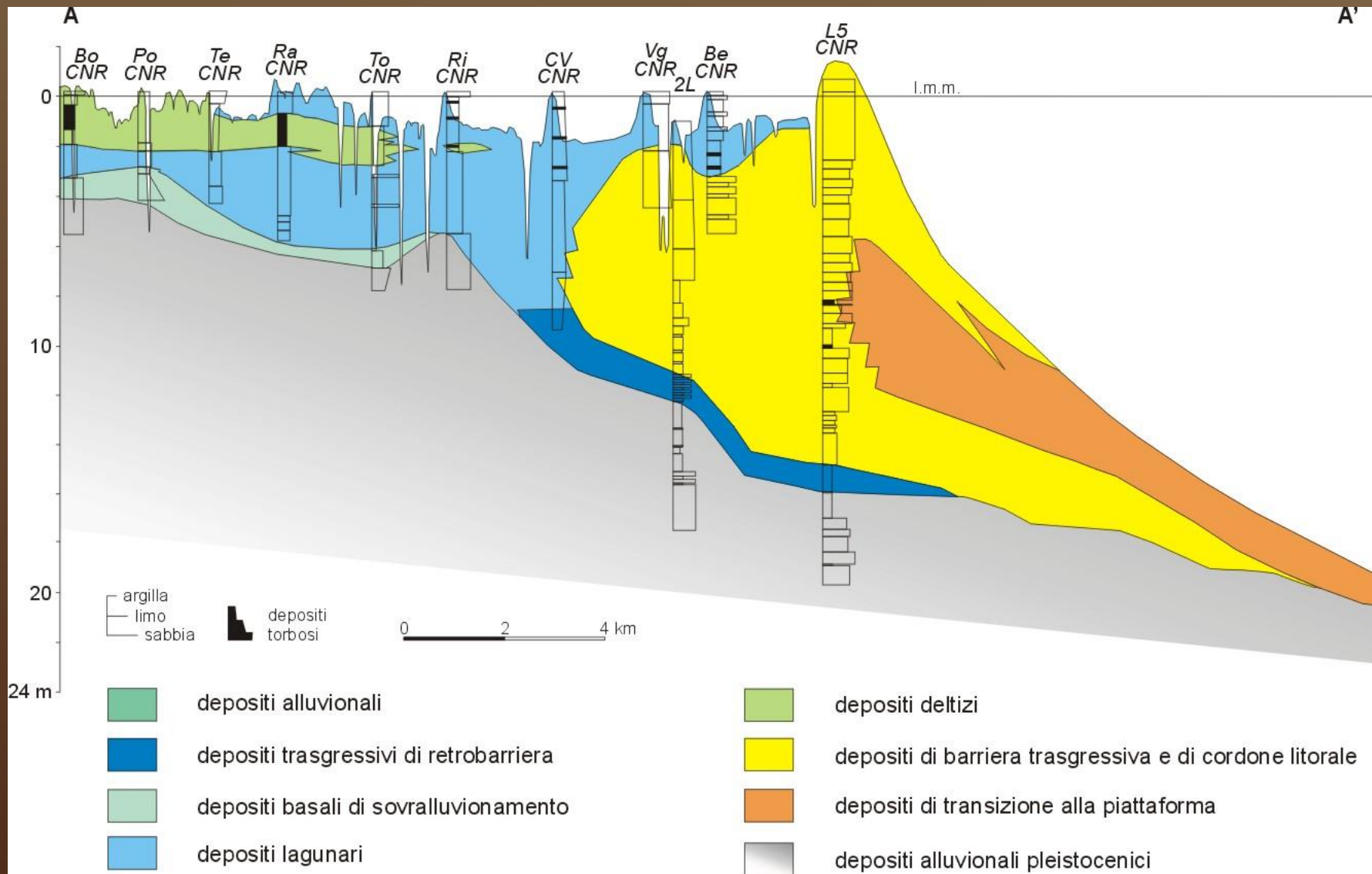
Laguna settentrionale



sezione lungo il litorale

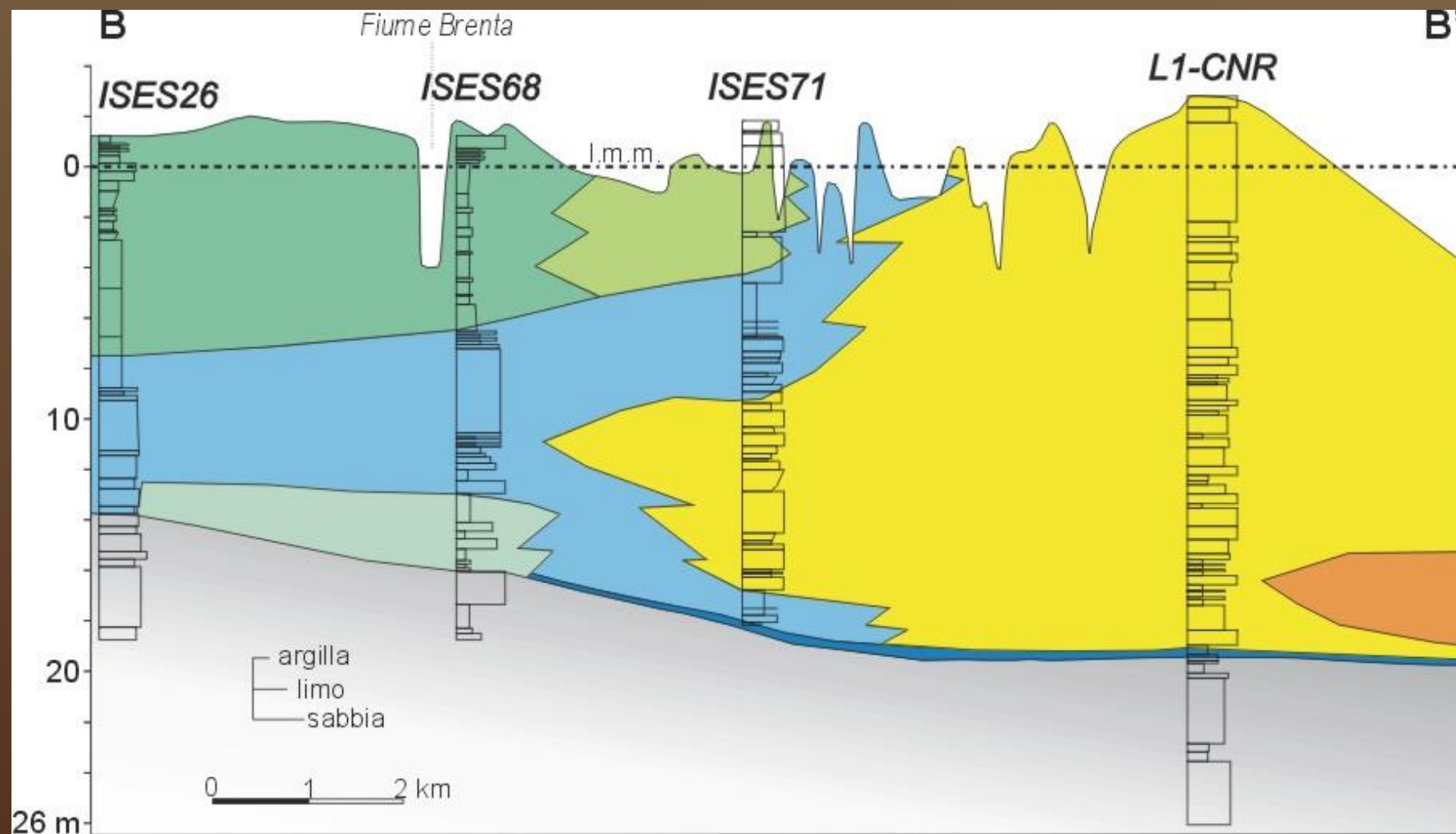


Laguna meridionale

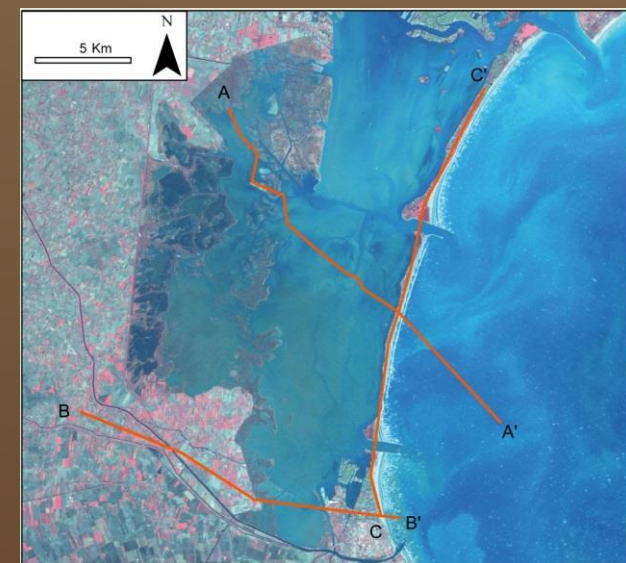


Tosi et al., 2007

Laguna meridionale



Tosi et al., 2007



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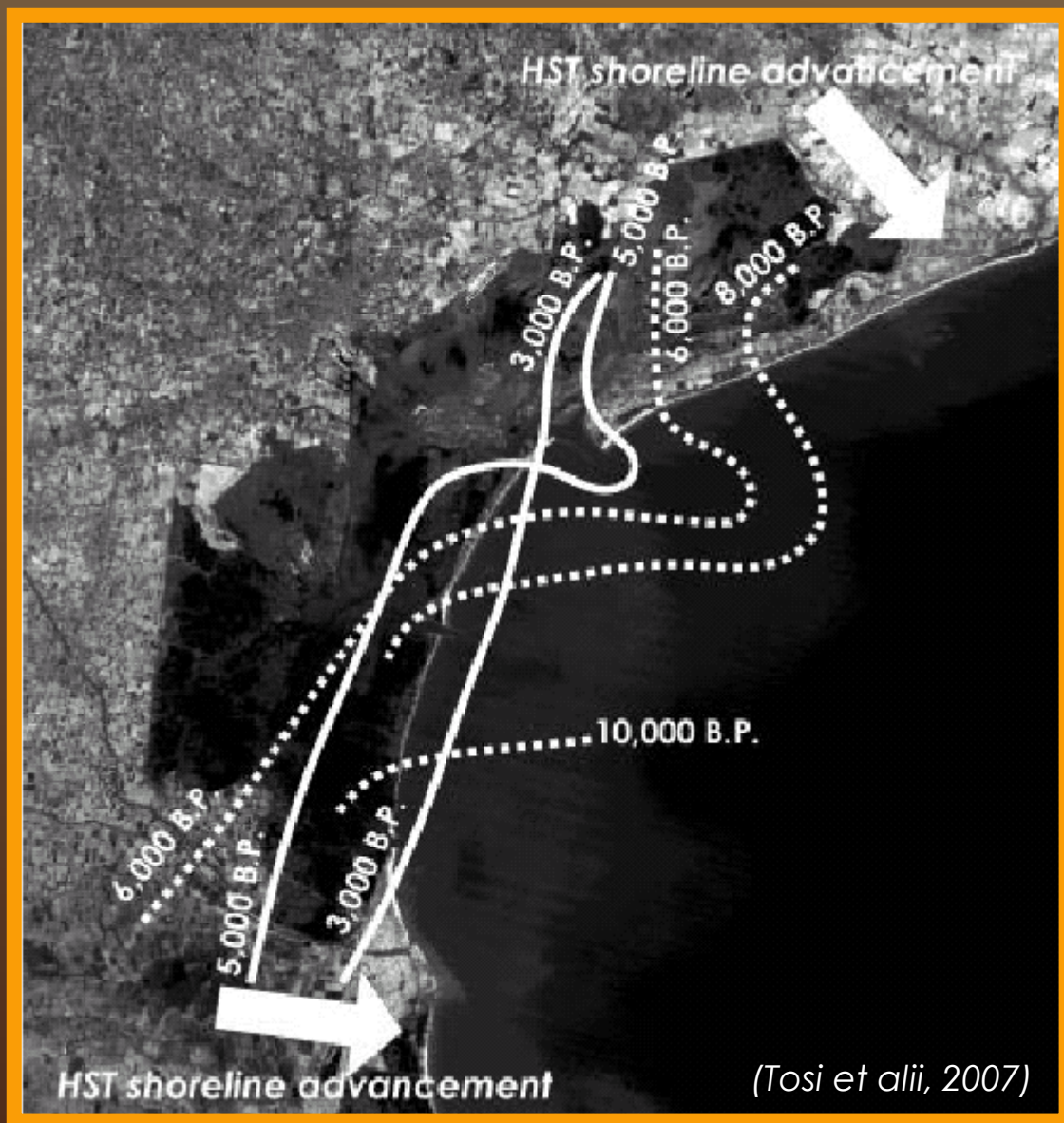
Evoluzione della laguna



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Evoluzione olocenica del litorale



- Nell'area centro-settentrionale prevalse la tendenza trasgressiva marina fino a quando venne ricoperto anche l'alto strutturale individuato presso la bocca di Lido
- A Sud, raggiunta la massima ingressione marina, iniziò la progradazione del litorale. L'abbondante apporto solido dei fiumi Adige, Brenta e Bacchiglione non fu più equilibrato dall'innalzamento eustatico, ed iniziarono ad avanzare i loro apparati di foce



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LE VARIAZIONI DELLA LINEA DI COSTA NEL SETTORE MERIDIONALE DELLA LAGUNA DI VENEZIA

A limite della massima ingressione olocenica 6000 BP (Favero e Serandrei Barbero, 1980)

B linea di costa San Pietro di Cavarzere – Motte Cucco – Motta Palazzetto – Peta de Bo 5000 BP

C linea di costa Cavanella d'Adige – Sant'Anna – Chioggia 2500 BP

D linea di costa attuale



(Bondesan e Meneghel, 2004)

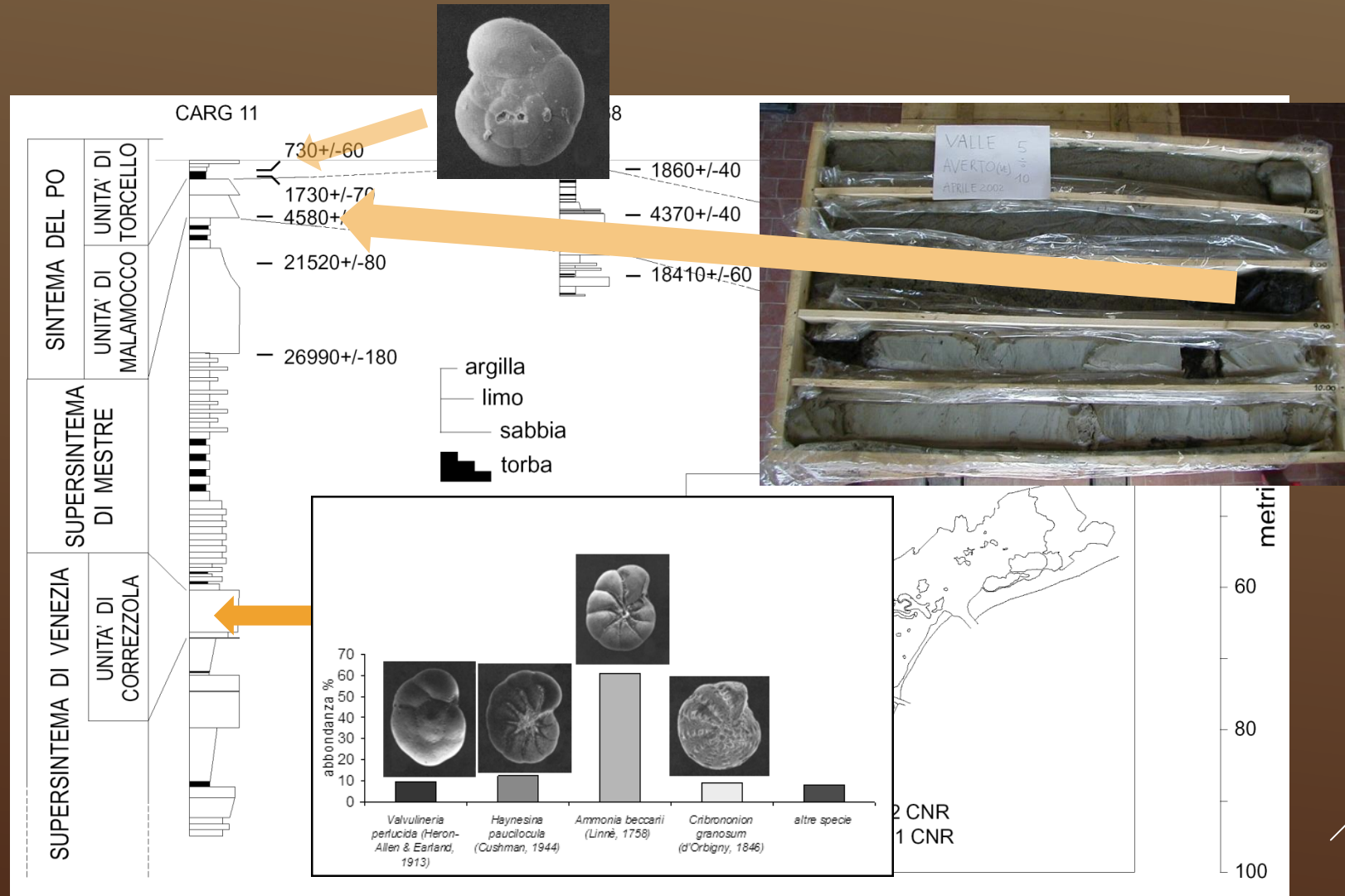
Il racconto dei sedimenti



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L'espansione della laguna sul margine continentale: l'area di Valle Averso nel bacino lagunare centrale





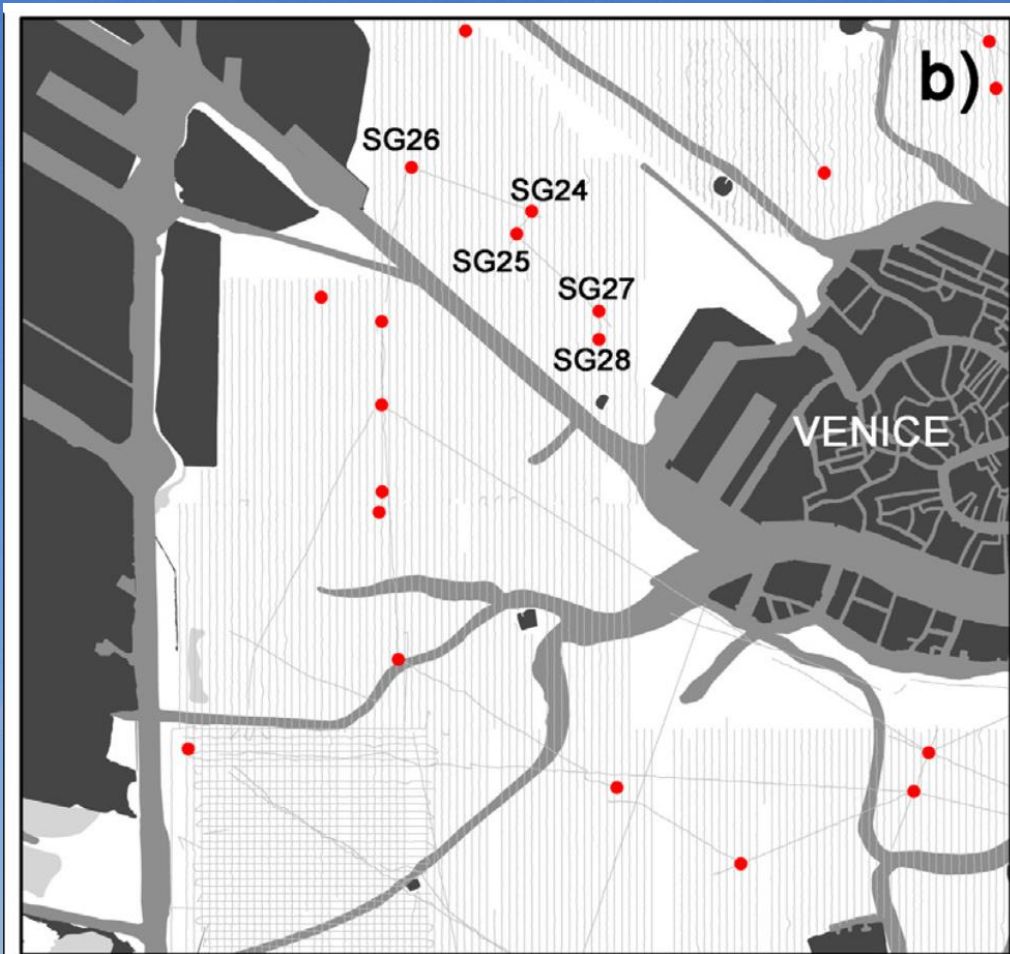
present
d

Donnici e Serandrei-Barbero, 2022

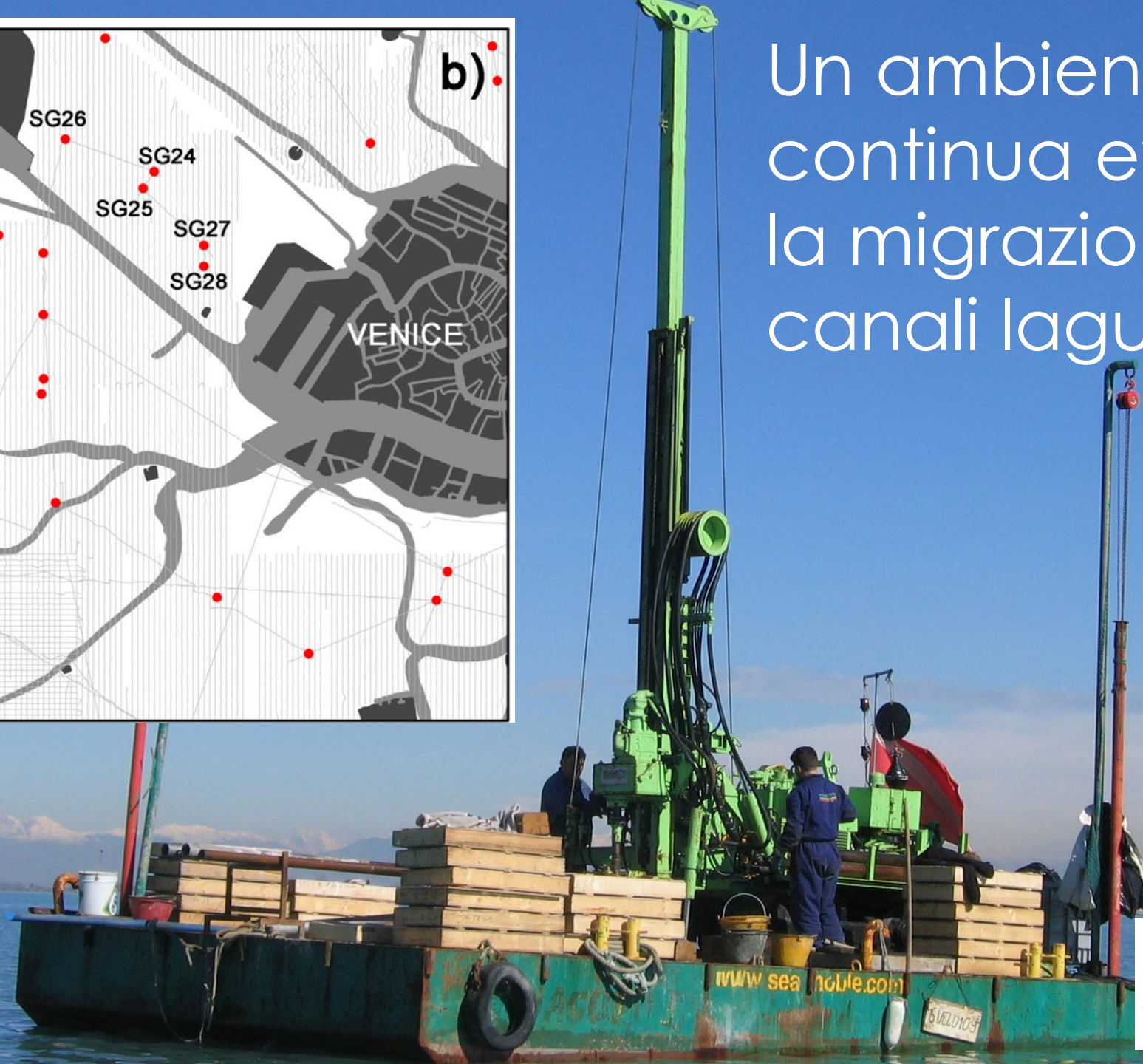


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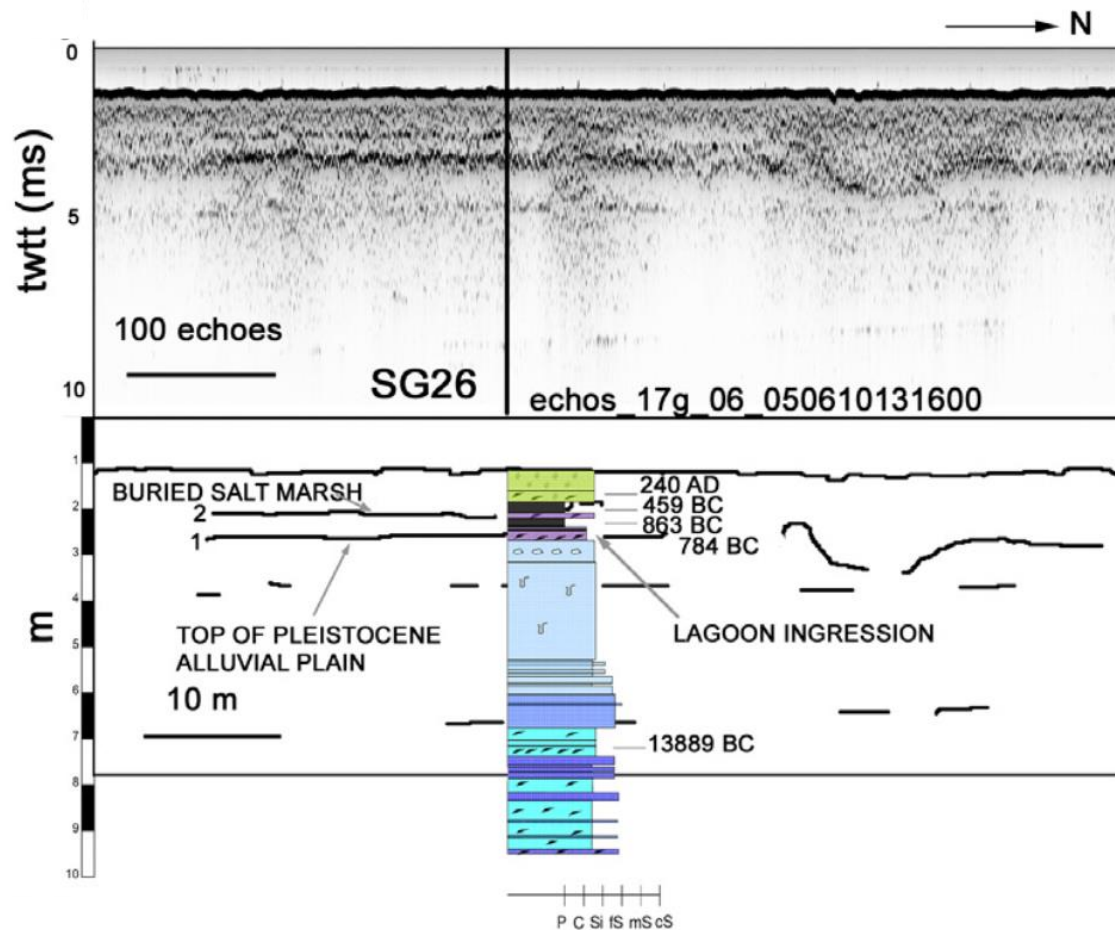


Un ambiente in
continua evoluzione:
la migrazione dei
canali lagunari



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profile 1

SEDIMENTARY FACIES

LAGOONAL FACIES L

- Lm** Dark-grey clayey silt with mollusks of mudflat
- Lcl** Clayely silt laminated with thin sandy layers of tidal channel
- Lcs** Medium to fine silty sand bodies of tidal channel
- Lsm** Greenish grey silty clay rich in peat and vegetable remains of salt marsh
- P** Palustrine facies: bioturbated dark clay rich in vegetal remains

ALLUVIAL FACIES A

- Aa** Consolidated sediments with reddish mottling and carbonate concretions (weathered fluvial facies)
- Af** Clayely silt of floodplain
- Al** Clayey silt interlayered with silty clay, silt, sandy silt and fine micaceous sand of levee
- Acs** Clayey silt interlayered with silty clay, silt, sandy silt and fine micaceous sand of crevasse
- Ac** Clayey silt interlayered with sand of channelized deposit

P = peat; C = clay; Si = silt;
fS = fine sand;
mS = medium sand;
cS = coarse sand

bioturbation burrows

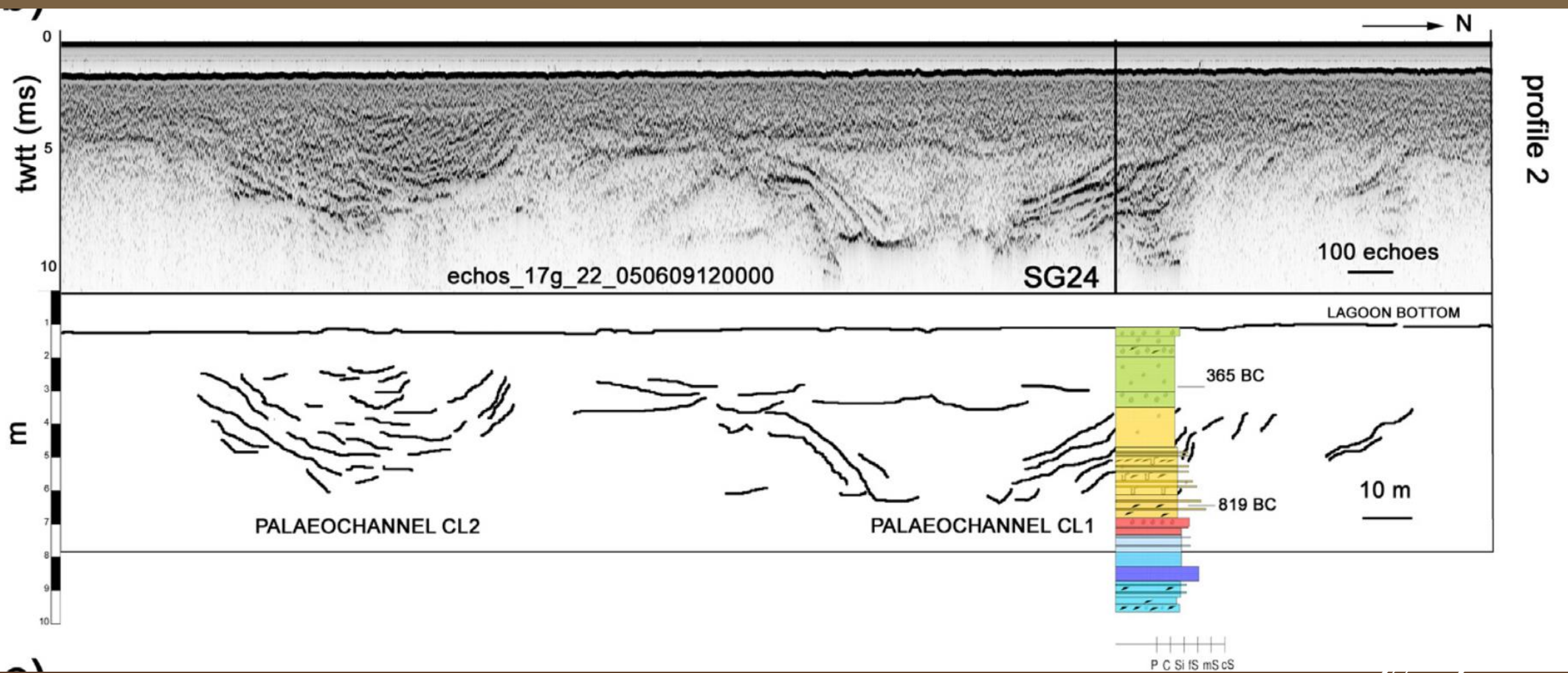
mollusks shells

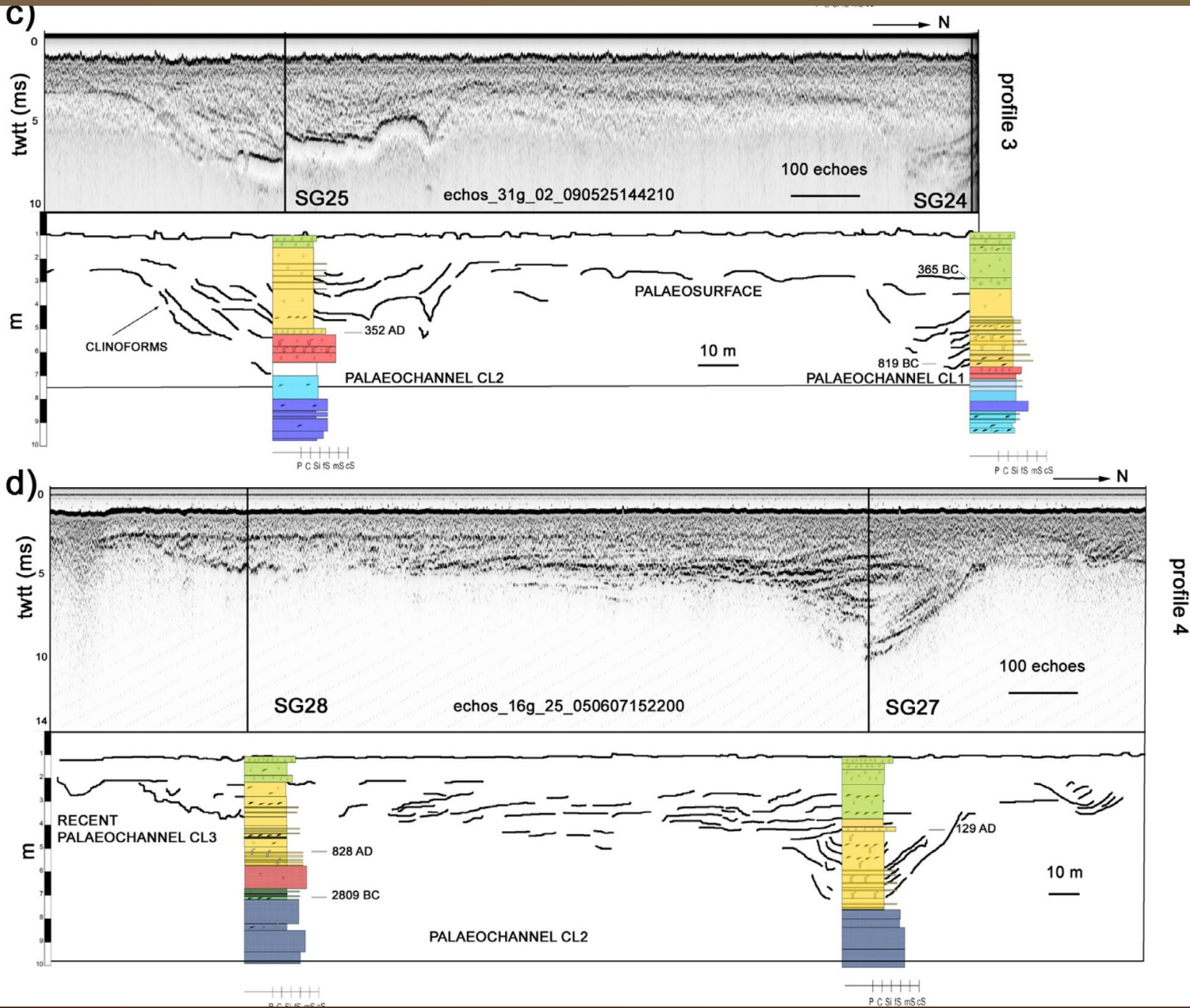
vegetal remains

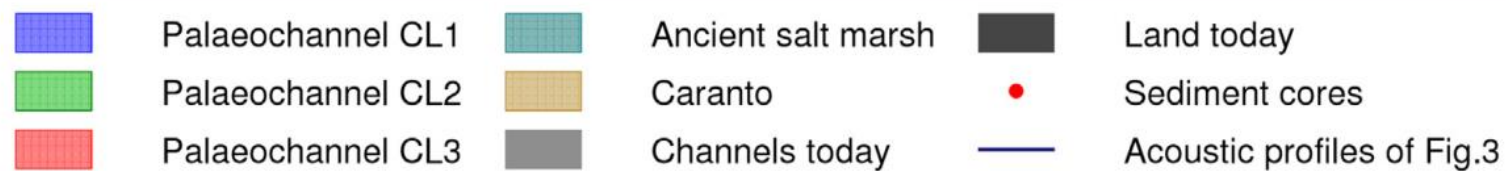
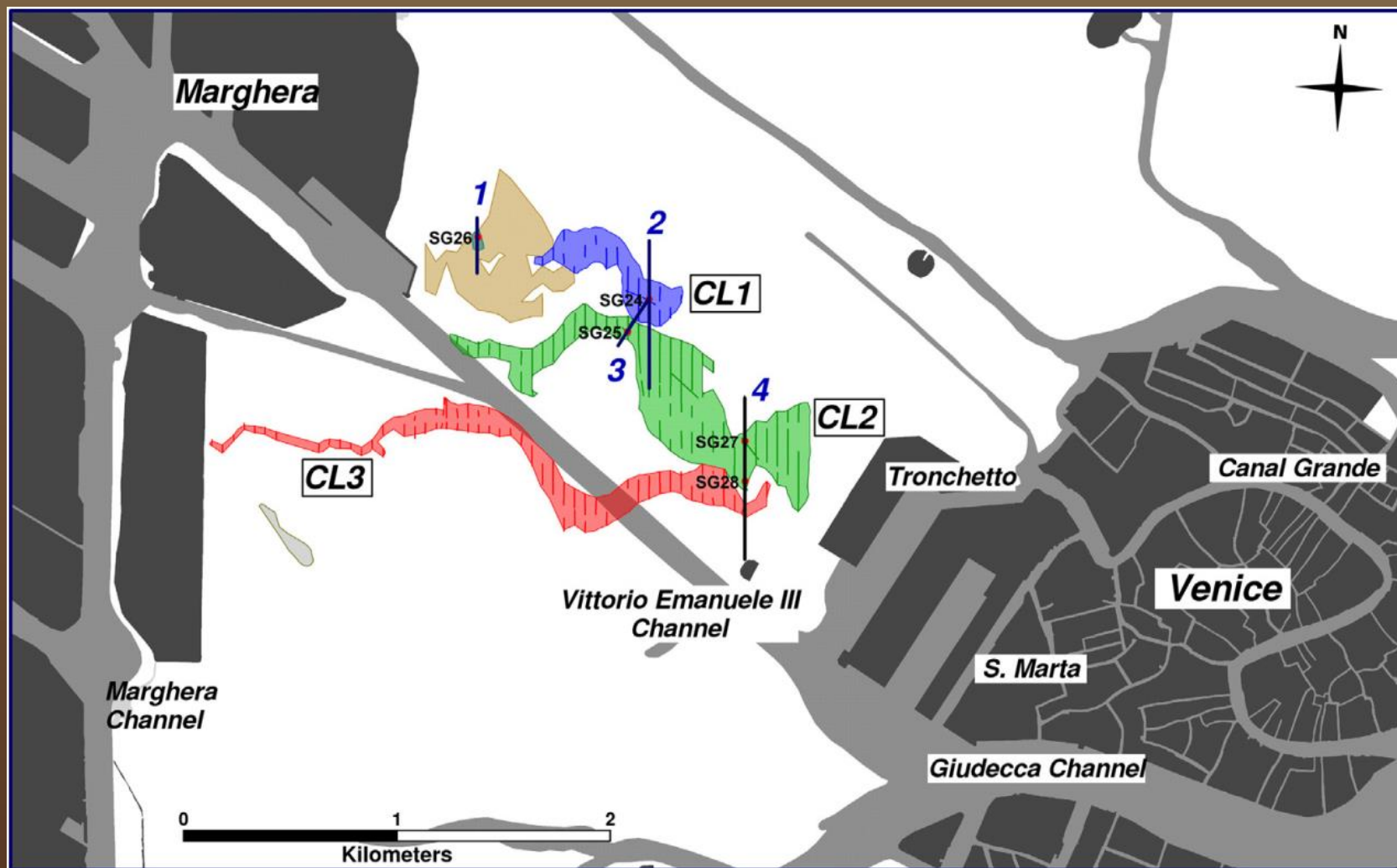
wooden fragments

peat

carbonate concretions







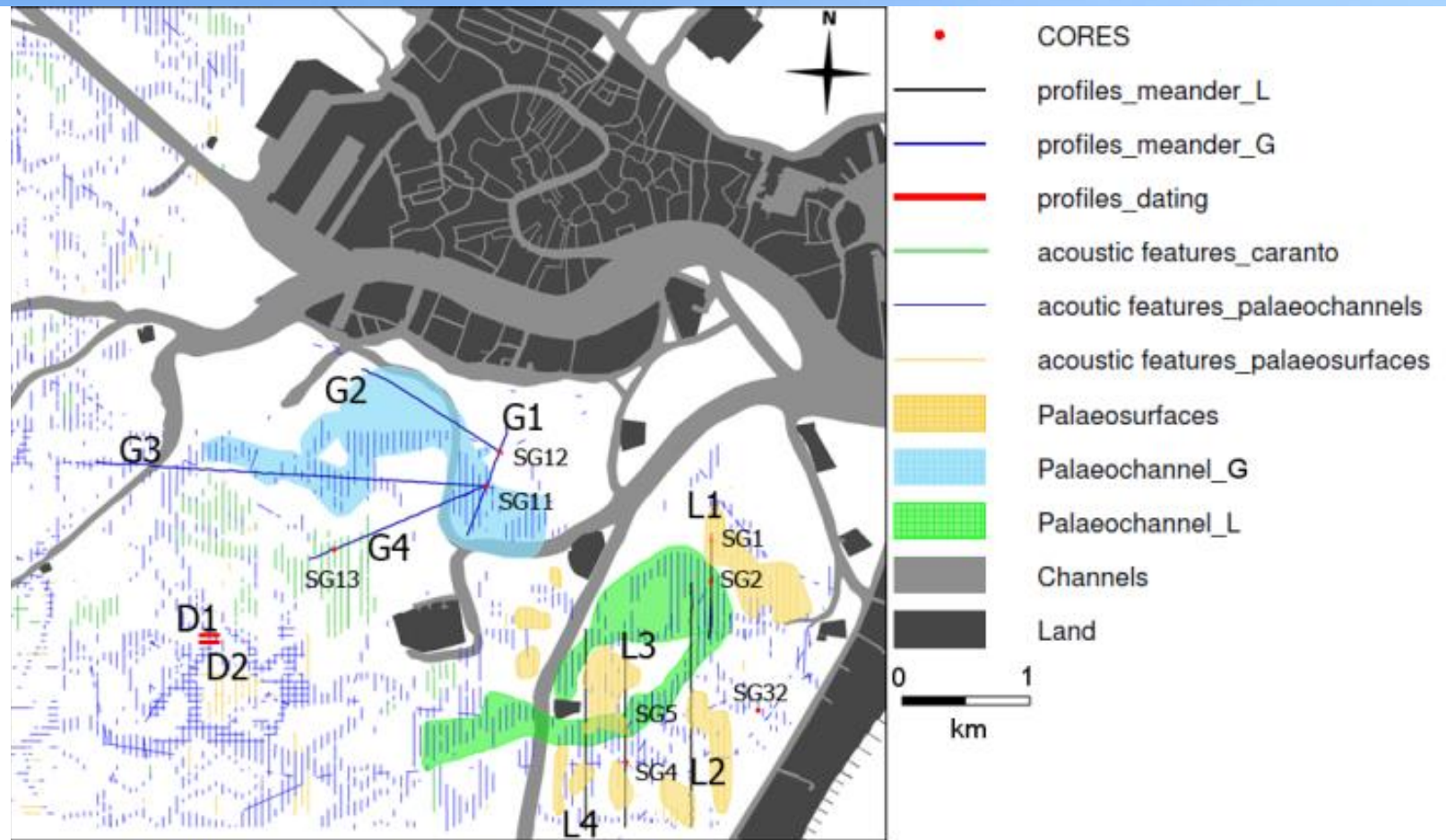
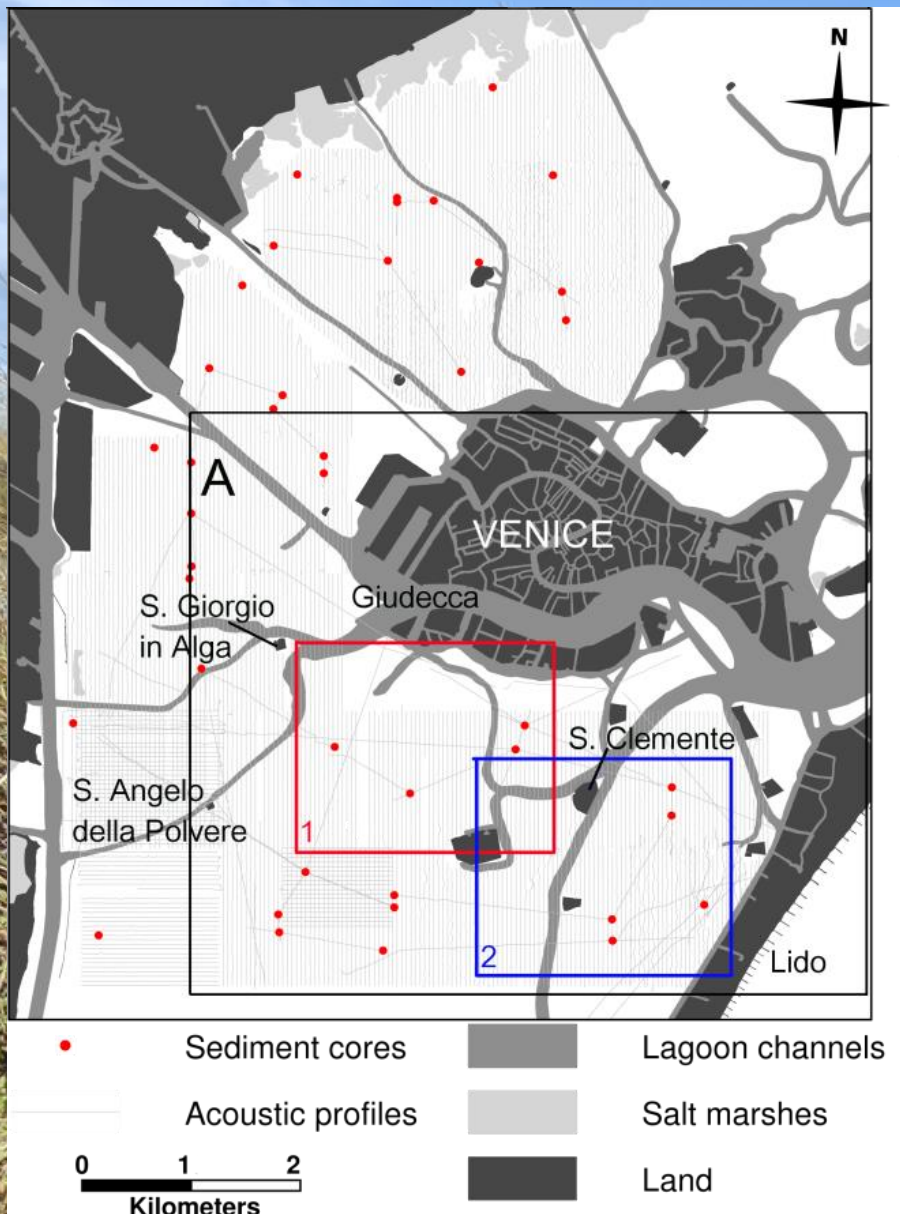


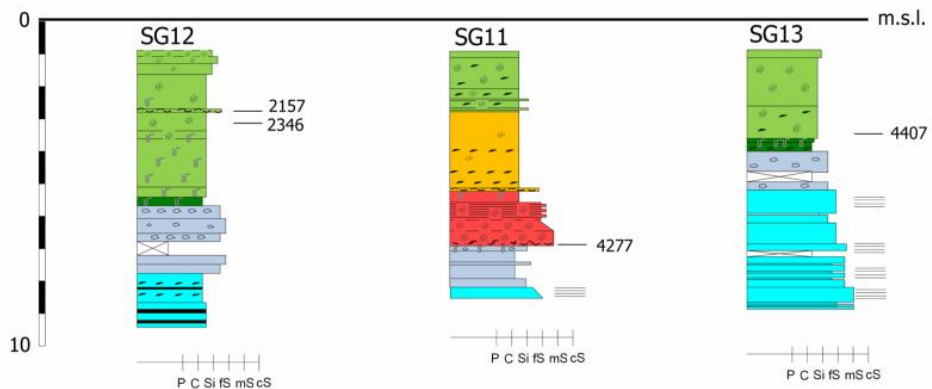
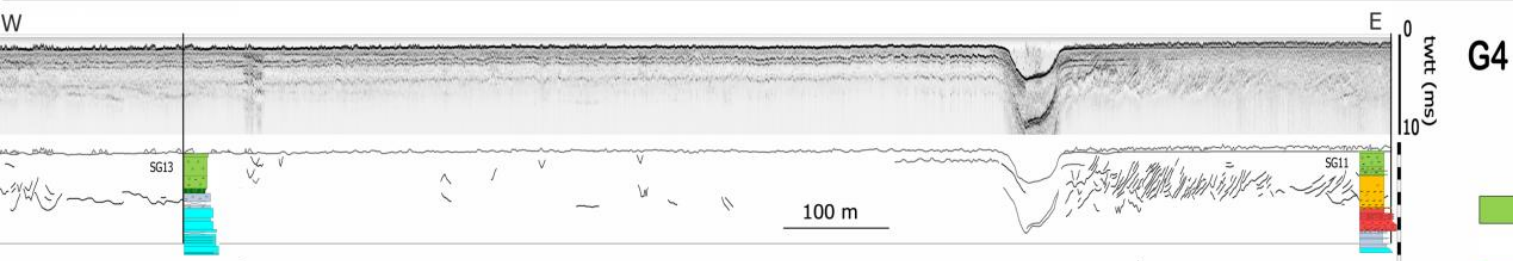
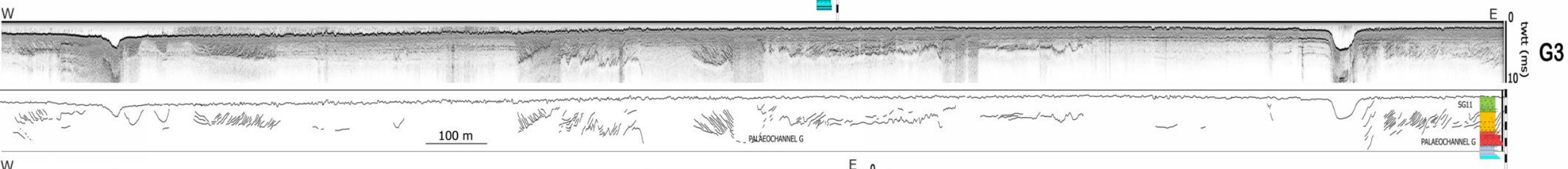
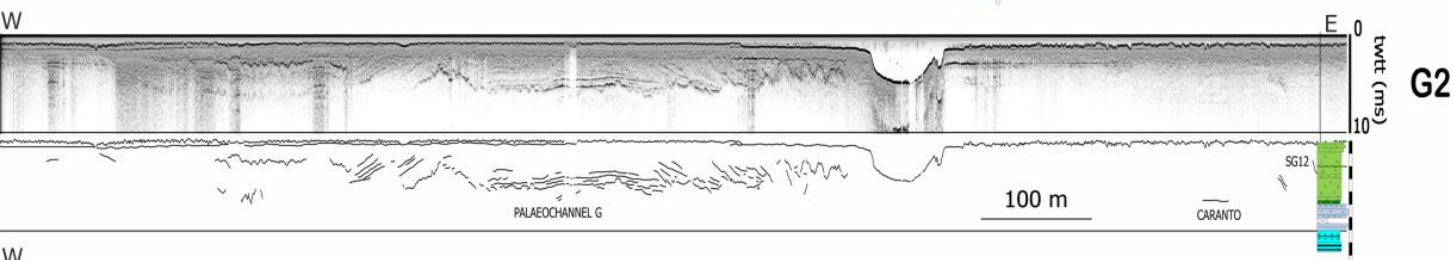
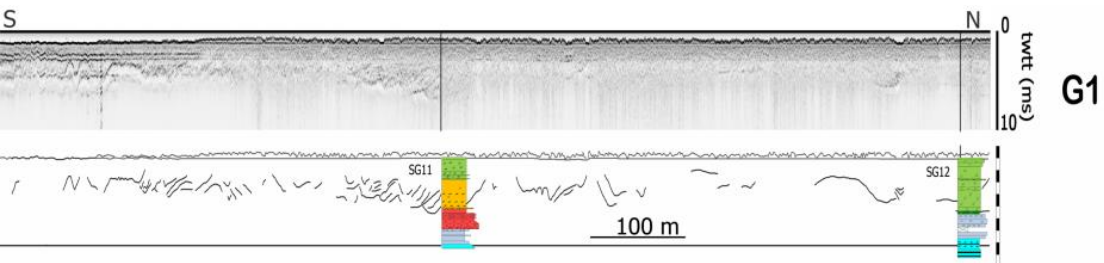
present
d



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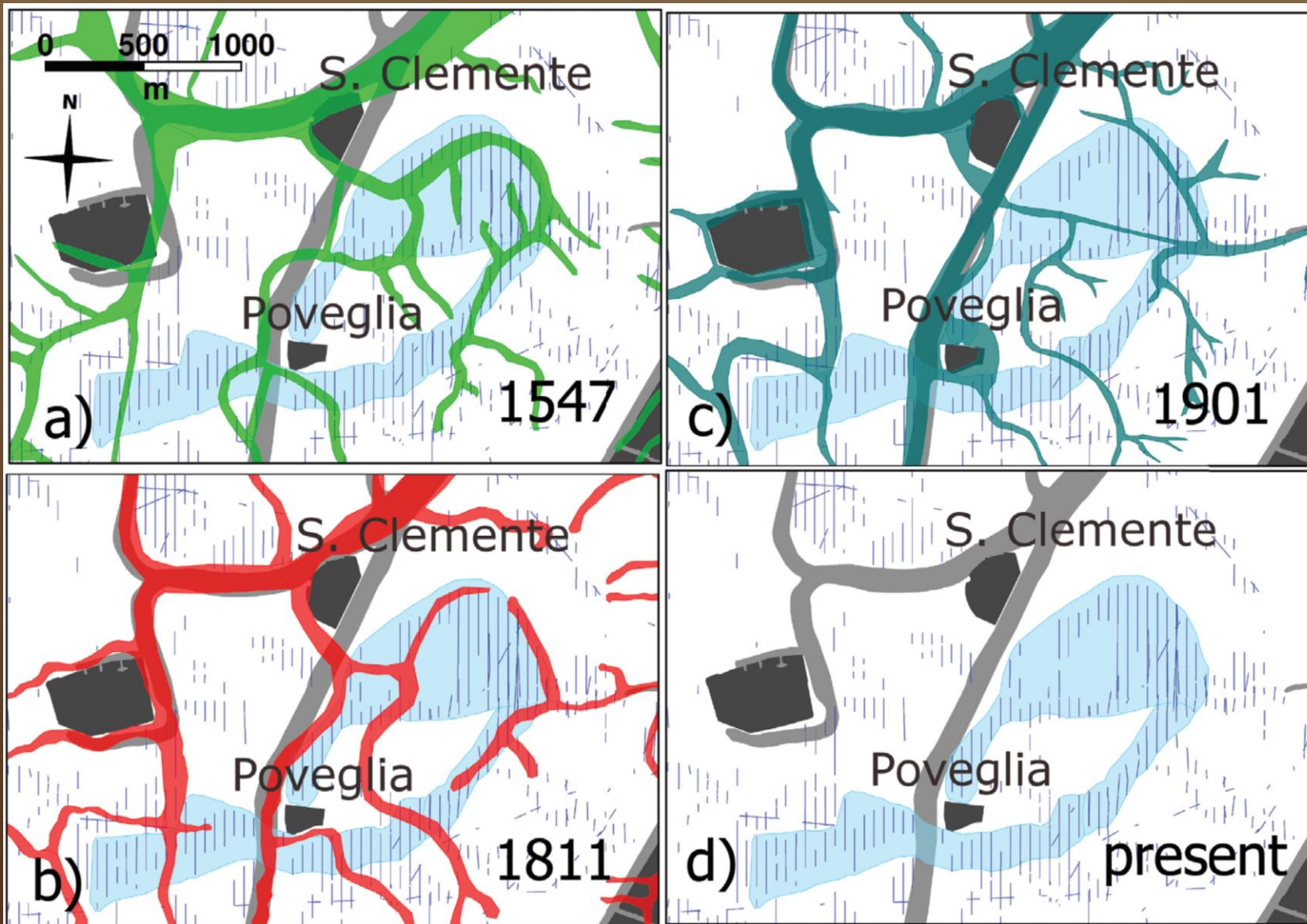




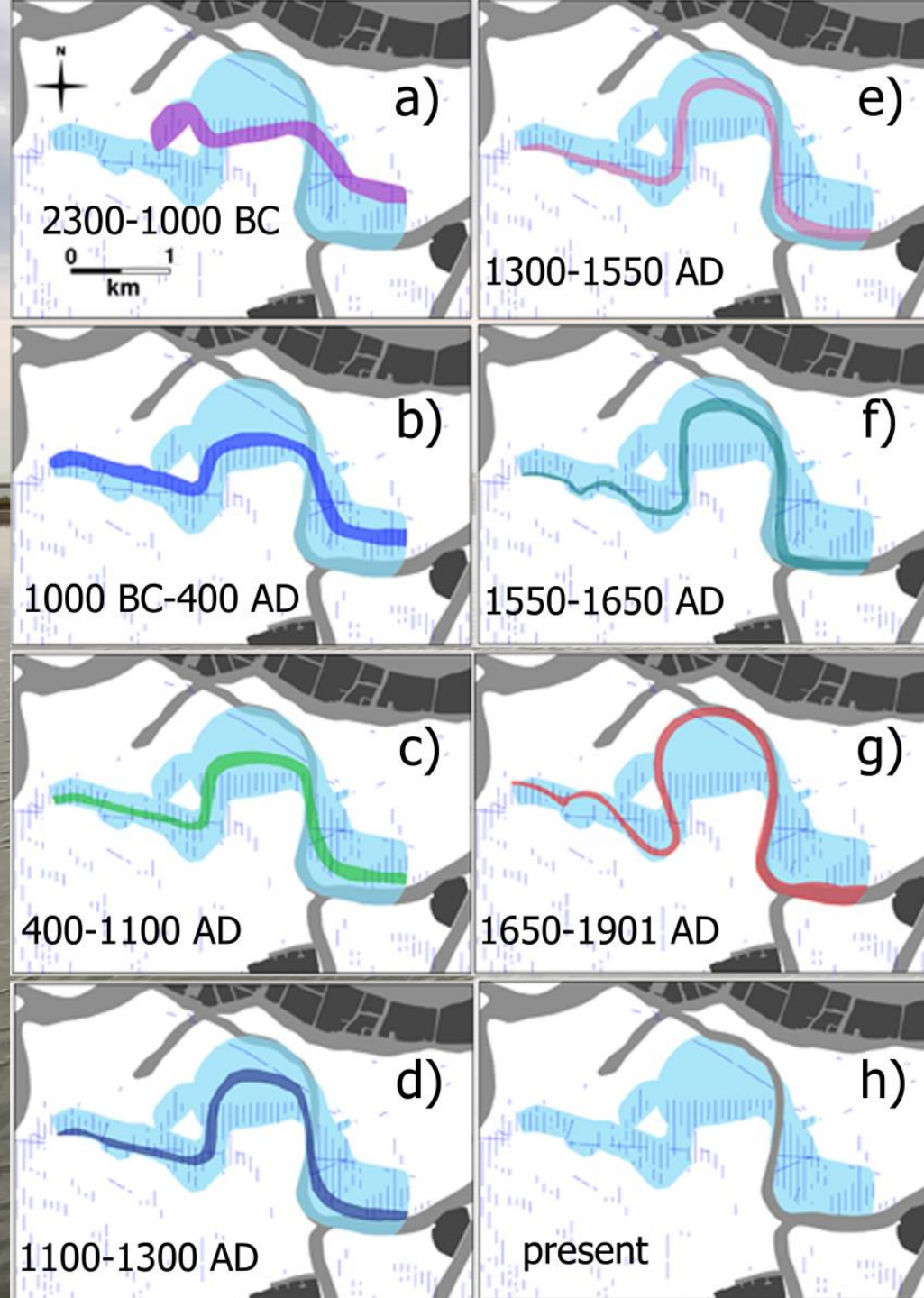


- Lagoonal facies-mudflat Lm
- Lagoonal facies-channel LCI
- Lagoonal facies-channel LCs
- Palustrine facies P
- Weathered alluvial facies Aa
- Alluvial facies A

- bioturbation burrows
- mollusks shells
- vegetal remains
- peat
- carbonate concretions
- planar lamination
- NNNN** calibrated 14C age (yrs BP)



E' stato possibile datare le strutture sepolte più recenti per mezzo del confronto con le carte storiche

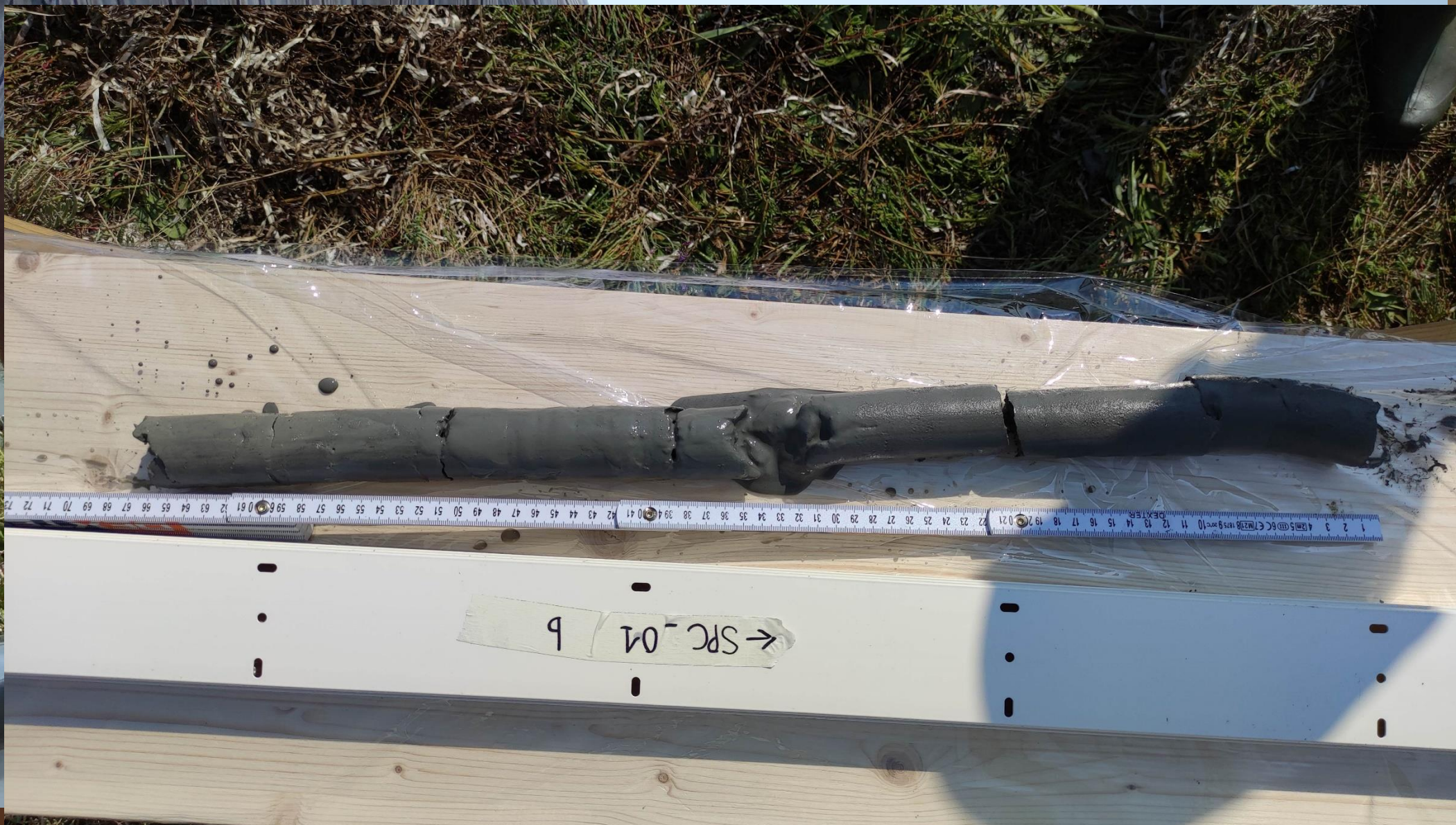




Grazie per l'attenzione



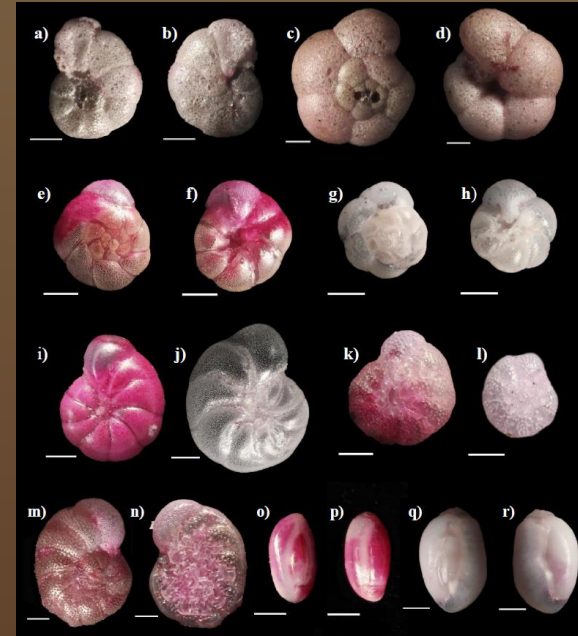




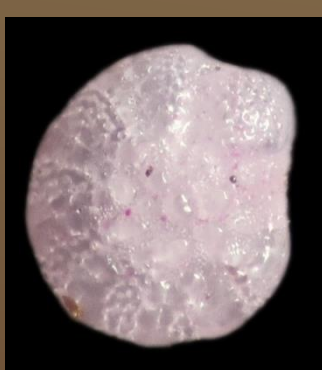
Barena naturale



Biocenosi - Associazione totale



ASSOCIAZIONI DI BARENA
LAGUNA DI VENEZIA



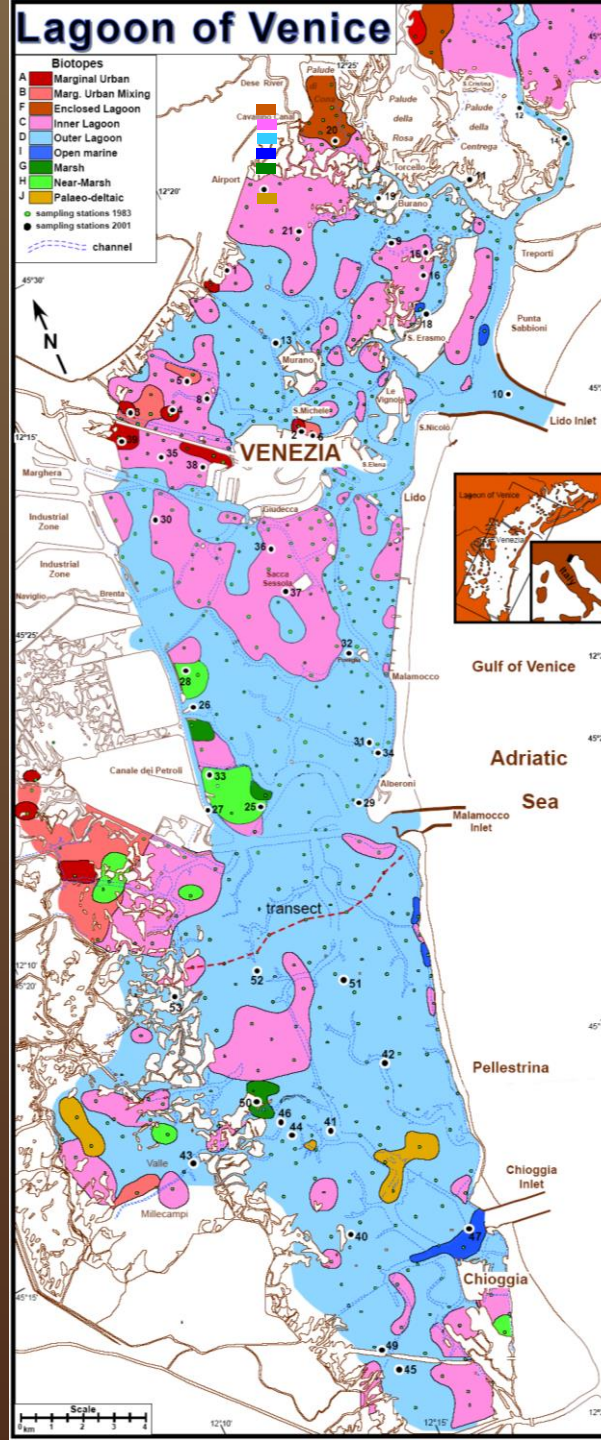
Cibrononion granosum



Haynesina paucilocula



Trochammina inflata



Ammonia beccarii



Quinqueloculina seminulum



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